Fedral Urdu University of Arts, Science & Technology

Department of Computer Science

BACHELOR OF COMPUTER SCIENCE
EVENING PROGRAM

Date: 02 FEBRUARY, 2009

Certificate

This is to certify that MR. MUHAMMED ATIF, MR. MUHAMMAD NADEEM were assign project “Project Bank” for the partial fulfillment of BS (CS) Degree Program. Project report is submitted by the student according to the supervisor requirements.

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SUPERVISOR
FARHAN SHAFIQ

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INCHARGE
FARHAN SHAFIQ

Phase # 1

Analysis

1. Project Overview

Team Organization	Closed Paradigm (CD)
Programming Methodology	Object Oriented (Modular)
Programming Environment	Visual Basic 6.0
Programming Tools	
Back-End	SQL
Front-End	VB-6.0
Supporting Tools	Ms Project, Ms Visio
Software Process Model	Prototype Model
Data Link Model	ADODC
Project Management Techniques	PERT (AON), CPM (AOA)
Project Costing	Rs. 99,000/-
Starting Date	November 2, 2009
Ending Date	February 2, 2009

Table 1.0: Project Overview

2. Introduction

The "Project Bank" (PB) project is an attempt to simulate the basic concepts of projects made by students. "Project Bank" Containing all information regarding the project and the group of students that makes the required project, with this project the teacher or a student can easily find the project details by year or date. The "Project Bank" contains the information like:

- Project titles
- Supervisor of the projects
- Year wise projects
- Search by project Title
- Search by Technology
- Etc.

3. Actual Problem

Project Bank (PB) did for the universities & institutes to save record of the project needs and preferences. Without sufficient Project Bank, some problems may encounter, such as then management want to search the project information but if the record is missed or the record is very old and not confirming about date of the project and other details like supervisor, batch number, group's student's etc. Besides, it is also a waste of time and resources without a proper managing of records.

The Project Bank application suitable for universities & institutes because students makes many projects and for managing and save the project information.

4. Domain Analysis

In this application of Project Bank the information is flow according to the requirement, after login the user select the programs such as MCS or BS and the years after the new form will open in which the detail of the project on selected years if user don't find the required information then he can go to search option they are search by Project Title, by Project Supervisor and by Name and year also, so the information if available then it will be displayed in table. The application is enable to enter the new project details with the required fields and also edit existing records and perform deletion if necessary. In last, if the user wants to log off temporary it will be logging off and to login again it required username & password to enter the application.

5. Project Scope

- It can be utilized in Universities & Institutions
- This project also utilize in Software house and in firm which have the large data collecting records
- As a file management system in offices

6. Feasibility Analysis

Feasibility analysis is the process by which feasibility is measured.

The goal of feasibility analysis

- to enable the organization to determine whether or not to proceed with a project
- to identify any important risks associated with the project

6.1. Technical Feasibility Analysis

Technical Feasibility

Familiarity with the application

- This project is similar to over previous projects the ARMS development team has completed for small commercial business. ARMS has successfully used Prototype to provide basic functionality for end-users, then incorporated additional features during each iteration of the development process.

Familiarity with the technology

- The application will be built SQL Which ARMS analysts/Programmers have extensive experience with.
- The employees have virtually no experience using Visual Basic 6.0 or Vb.Net but all are comfortable with using PC's. Tanning should be sufficient to overcome their inexperience.

Project size

- Project size is relatively small. It will take 5 months to complete. Future expansion is planned but will not affect this project, though business expansion may lead to subsequent projects.

6.1.1. Hardware Software Specification

Hardware Specification

- **System:** Intel Pentium 800Mhz or higher processor based computer
- **Monitor Screen**: 1024 X 768 is recommended
- **RAM:** At least 128Mb Ram Rec. 256MB
- **Storage Media:** At least 2 GB Hard
- **Backup Storage:** Monthly Bases write on CD

Software Specification

- **Operating System:** Windows XP, 2000 Professional
- **Application Tools:** **Front End:** Visual Basic 6.0
  Back End: SQL
- **Supporting Tools:** Ms Project 2003
  Microsoft Visio 2003

6.2. Operational Feasibility

Our Purposed system is to help management to generate more business and increase customer satisfaction by developing reward system. The interface is user friendly as well as all the actions perform can understand easily.

Screen Shots & Explanation

Splash Screen

This screen appears once you enter to the program. It shows the progress of the program loading. Once the program finished loading, user can login into the system.

Figure 6.2.1: Splash Screen

The Login Screen

This is the Login Screen for Manager to enter the given login name and password to authenticate their access to Project Bank system. Then, clicks ENTER to access into the system.

Figure 6.2.2: Login Screen

Main Screen for Project Bank

This is the main screen of Project Bank (PB) for the manager. The two Combo box Select Program & Select Year listed the options you would go. The options include in Select Program is MCS & BS then another is Select Year in which three years can be mention 2005-07 after that the new window will open it and with the detailed information o f the project.

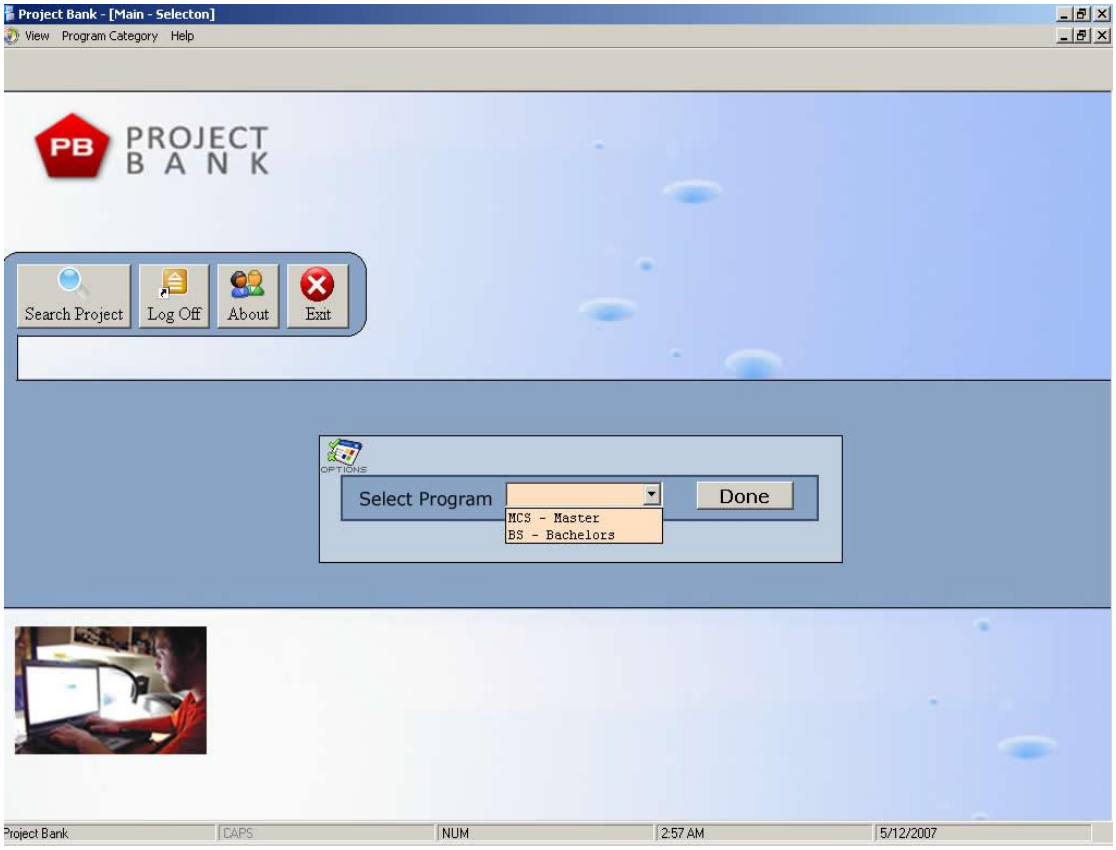


Figure 6.2.3: Main Screen

Project Record Screen

The screen shows the selected program & year/batch records with all types of information and the manger can be add record, edit record, delete record & save record. From this screen there is also search & logoff options that have its own functionality.

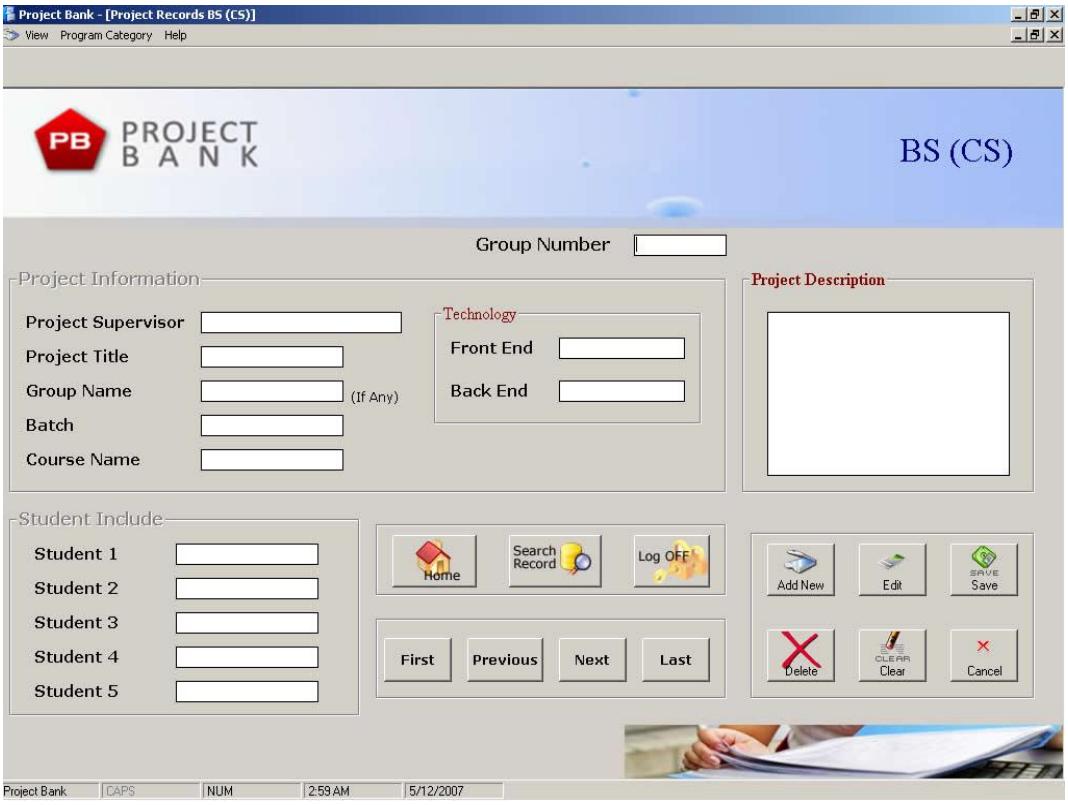


Figure 6.2.4: Record Screen

Search Project Screen

The screen displays the search option like search project by Project Title, search project by date, search project by technology. When you select the search by date you should be follow the search criteria as shown in example on screen.

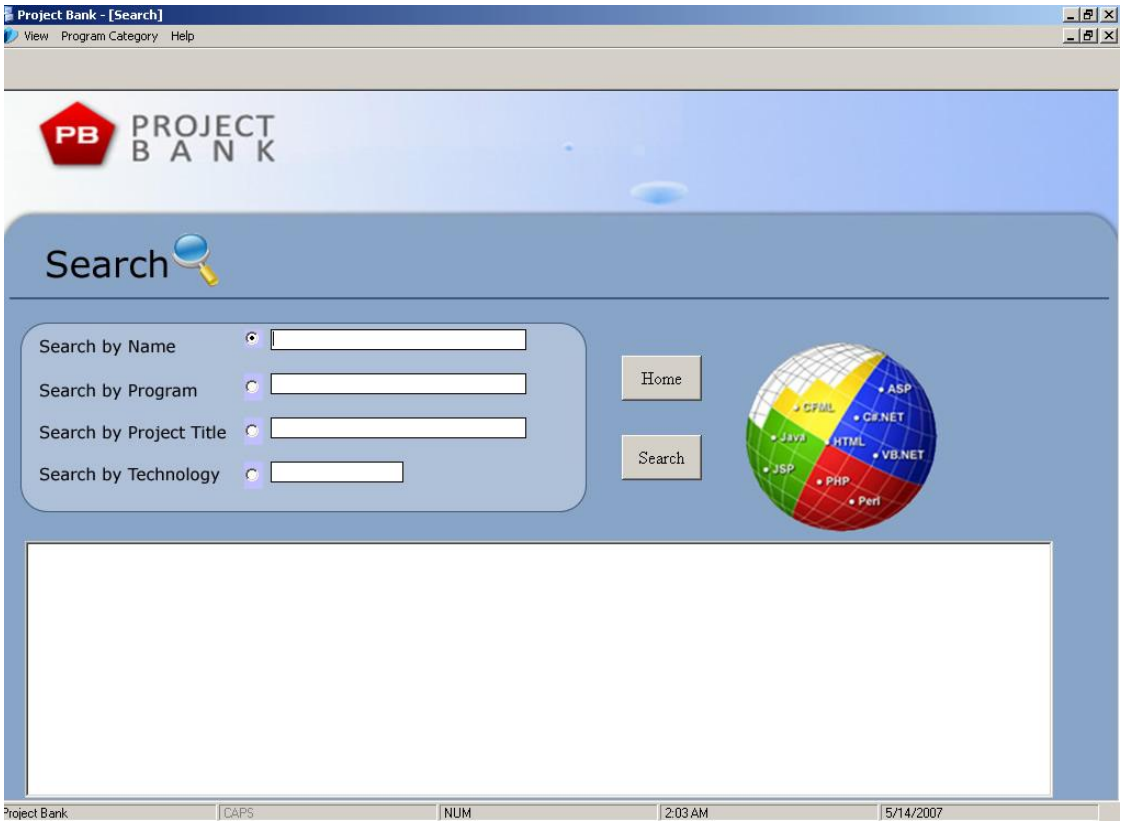


Figure 6.2.5: Search Screen

The Logoff Screen

Logoff the screen may again input the username & password and press enter. If the application is accept password then you will see the main screen.

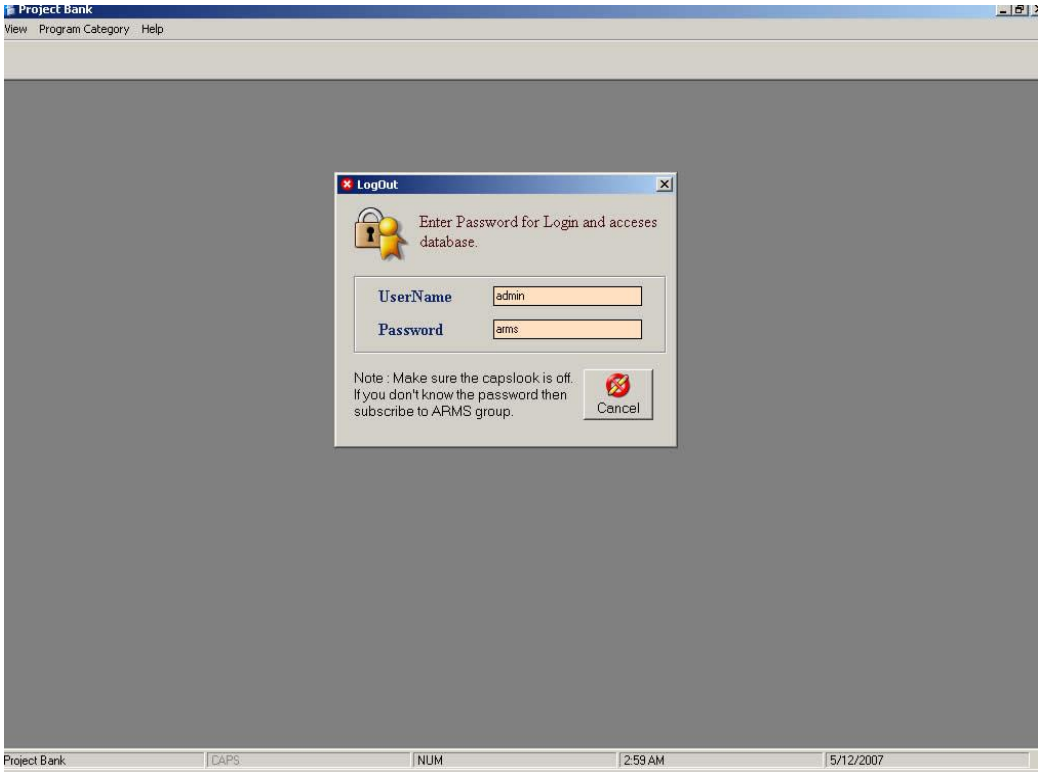


Figure 6.2.6: Logoff Screen

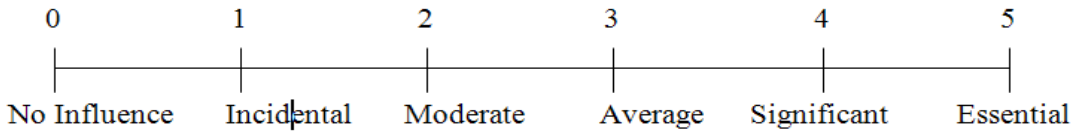
6.3. Economical Feasibility

6.3.1. FP & COCOMO

Using the Basic COCOMO technique for estimation, we have found out that our project that development time for similar projects was on average of 5 months, which is more than what we have; however, it is close. About the person per month or PM, it was estimated to be 6 PM.

Estimation Technique for Function Points

The function point –FP- metric can be used to measure the functionality delivered by the system. It rates each factor on a scale from zero to five where zero stands for No Influence and five for Essential. The following is what the scale looks like.



For each factor a number will be given and at the end all these numbers will be added and the function point will be calculated according to the formula of,

$FP = CT \times [0.65 + 0.01 \times \sum F_i]$,

Where **FP** = Function Points

CT = Count Total

$\sum$ = Sum

$\mathbf{F_i}$ = (I = 1 to 14) are Value Added Factors (VAF).

To compute the function points, we need two major variables to be computed: One is the Value Added Factors (VAF) which will be based on questions; the other is the Count Total (CT)

Questions to Calculate VAF

1. Does the system require reliable backup and recovery?
2. Are specialized data communications required to transfer information to or from the application?
3. Are there distributed processing functions?
4. Is performance critical?
5. Will the system run in an existing, heavily utilized operational environment?
6. Does the system require data entry?
7. Does the data entry require the input transaction to be built over multiple screens or operations?
8. Are the Internal Logic Files (ILF) updated during run-time?
9. Are the inputs, outputs, files, or inquiries complex?
10. Is the internal processing complex?
11. Is the code designed to be reusable?
12. Are conversion and installation included in the design?
13. Is the system designed for multiple illustrations in different organizations?
14. Is the application designed to facilitate change and for ease of use by the user?

Count Total

The major information we need to calculate the count total are: Essential Inputs (Eis), External Outputs (Eos), External Inquiries (Eqs), Internal Logical Files (ILFs), and the External Interface Files (EIFs).

Estimate for Function Point Technique

Table of VAF Results

We are going to summarize the results in a table so it will be easy to use and convenient to see the results. The total number calculated will be used in the function point's formula we have mentioned **FP = CT sX [0.65 + 0.01 X $\sum F_i$],**

Question #	Rating
1	4
2	0
3	0
4	3
5	2
6	4
7	0
8	3
9	2
10	3
11	3
12	2
13	1
14	4
TOTAL	**31**

Table 6.3.1: VAF Result

Count Total Results

The inputs include are the predefine values including the admin name and the selection of program in combo box. The outputs will be the data files and windows screens. There will

be thirteen inquiries that user enter the runtime. There will be no internal logical and no external interface.

Information Domain value	Count		Simple	Average	Complex		Total
Input	2	×	3	4	6	=	6
Output	1	×	4	5	7	=	4
Inquires	13	×	3	4	6	=	52
Internal Logical Files	0	×	7	10	15	=	0
External interface files	0	×	5	7	10	=	0
Total	→		→	→	→		62

Table 6.3.2: Count Total Calculation

FP and LOC Calculations

According to the formula:

FP = CT X [0.65 + 0.01 X ∑ F_i],

FP = 62 X [0.65 + 0.01 X 31] = 59.2 **~ 59**

Since we are using Visual Basic in programming and according to the table in the Pressman book, the average LOC/FP = 42 (average), where LOC means Lines of Code.

FP X LOC/FP

LOC = 59 X 42

LOC = 2478

This means that we need an average of 2478 lines of code in order to complete it.

Estimation Technique for COCOMO

Description of the technique

In this section, we are going to use BASIC COCOMO to calculate PM –Person per Month, and D –Development time. Since our program is going to run by itself, it is an organic program, thus the COCOMO formulas that we are going to use will reflect this condition.

BASIC COCOMO

The formulas for BASIC COCOMO for an organic program are as follows:

$PM = 2.4\ KLOC^{1.05}$

$D = 2.5\ PM^{0.38}$

Where:

PM = Person Month

KLOC = Thousand Lines of Codes

D = Development time in Months

From what we obtained earlier we have LOC equals to 2478, so using the formulas:

We get:

$PM = 2.4 \text{ X } 2.478^{1.05}$

PM = 2.4 X 2.593

PM = 6.223 = 6 PM

This means that our project requires 6 full time persons.

$D = 2.5 \text{ X } 6.223^{0.38}$

D= 2.5 X 2.00

D =5 months

Software Cost

According to our calculation the cost of the software is calculated by given formula

Software Cost = 1.n ∗ (AMS) PM

Where,

PM is the effort applied in person-month.

AMS is the average monthly salary of employees.

N are operational expenses.

Software Cost = **1.10 ∗ (15000) * 6**

Software Cost = **Rs 99,000 /-**

Estimation Technique Software Engineering Environment

The software Engineering Environment or SEE can be divided into two categories: The software and the hardware. Since we are using Microsoft Visual Basic provided to us by the library, we do not need to spend money on acquiring it. Also Microsoft Access came with our systems when we bought our laptops and computers. However, to learn programming with visual basic and Access, we had to require some training and buy some book to use it as a reference. Below is a breakdown of the cost we carried out.

Cost of Software

Microsoft Visual Basic 6.0	Rs 0.00/-
Microsoft Access 2003	Rs 0.00/-
Microsoft Visual Basic Book & Training	Rs 3000/-
Microsoft Access Book	Rs 200/-
Microsoft Visio	Rs 0.00/-

Cost of Hardware

Own Laptops and computers	Rs 0.00/-

Technique of Optimistic, likely, and Pessimistic LOC Estimates

Description Estimation

This technique deals with three conditions to calculate the Optimistic, likely, and Pessimistic LOC Estimates. Usually the optimistic is 80%, likely is 100%, and pessimistic is 120% of the total LOC. The formula used in this estimate is as follows:

$$\text{Expected LOC} = (a + 4m + 2b) / 7.$$

Where,

a = optimistic

m = likely

b = pessimistic

Estimate for Optimistic, likely, and Pessimistic LOC Technique

We need to calculate each LOC for each of the three conditions, so the numbers will be as follows:

a = 2478 X 80% = 1982.4

m = 2478 X 100% = 2478

b = 2478 X 120% = 2973.6

Expected LOC = [1982.4+ (4 X 2478) + (2 X 2973.6)] / 7

= (1982.4 + 9912 + 5947.2) / 7

= 2548.8

According to the answer that we have here, it is still close to 2478 which we obtained from the FP section.

Effort

As calculated from section above expected person-month (PM) will be 6 PM, which means we need six full timers.

Time

The time needed to complete the project and working as required will be 5 months which would equal to 150 days considering the month average days is 30 days.

Productivity

Productivity = KLOC / PM

= 2478 / 5

= .4956 X 100 %

= 49.56 %

So, according to our previous values of KLOC and PM, the calculated productivity utilized is about 49 %, which is not as high as we would expect it to be.

Cost per LOC

Cost per lines of code can be calculated using the formula:

Cost = Rs / LOC

= 99000 / 2478

= Rs 39.95/- for each line of code.

Quality

Quality can be measures using the following equation:

Quality = Defects / KLOC

= 5 / 2.478

= 2.01

Defect" is defined as the number of non conformance to requirements per year. We are planning not to have any defects in our product since we are following the highest quality software engineering techniques; however, things happen, so we assume 5 defects might exist in our product.

6.4. Benefit Analysis

- Tangible benefits can be easily quantified. Measured in terms of monthly or annual savings or of profit to organization.
- Intangible benefits related to user side.

The Tangible & Intangible Benefits for our project is as follows

Tangible Benefits	Intangible Benefits
▪ Fewer processing errors ▪ Increased throughput ▪ Decreased response time ▪ Increased sales ▪ Reduced credit losses ▪ Reduced expenses	▪ Improved customer goodwill ▪ Improved student morale ▪ Better service to community ▪ Better decision-making

Table 6.4: Benefit Analysis

7. Requirement Gathering

In software development, *analysis* is the process of studying and defining the problem to be resolved. It involves discovering the requirements that the system must perform, the underlying assumptions with which it must fit, and the criteria by which it will be judged a success or failure.

7.1. Software Requirement

7.1.1. User Requirement

- Intel Pentium based computer
- Monitor Screen of 1024 X 768 is recommended
- At least 128Mb Ram
- Storage Media: Hard disk approx 10Gb
- Visual Basic 6.0
- Ms Project 2003
- Microsoft Visio 2003
- Windows [2000 professional, XP professional]

7.1.2. Functional Requirement

- Login to the system
- Select program and batch
- View the project details
- Editing an existing record
- Insert new project details by Add New record
- View the ending & start date of project
- Removes a record from the system
- Search record by project title
- Search record by date & technology

7.1.3. Non-Functional Requirement

- The application should one users at a time
- There can only be two category BS & MCS with three years record
- Only the administration can input/edit/delete record

8. Project Management

8.1. Problem

We can analyze our problem as it is **Simple** and our target is to display the corresponding output

Project is a series of activities and a non-routine task the **project related problem** that we face are as follows.

- Task is dependence each other so we can wait until the dependent task is not complete until to next task
- Quality skills are not available
- Lack of team work.
- Resources are not available
- Trained people are not available

Product must have effective communication with customer & requirement; we can analyze whole system and collecting data & information that required.

- We established project objectives and scope
- Considered alternatives solution
- Estimates the cost
- Considered the known risk

8.2. Process Model

The model that we prefer is described as **Prototype Model**. In prototype Model the customer defines a set of general objectives for software, but does not identifying detailed input, processing, or output requirement. In other cases the developer may be unsure of the efficiency of an algorithm.

Ideally the prototype serves as a mechanism for identifying software requirement. If a working prototype is built, the developer attempts to make use of exiting program fragments or applies tools (e.g., report generators, window managers, etc) that enable working programs to be generated quickly.

In most projects, the first system built is barely usable. It may be too slow, too big, and awkward in use or all three. There is no alternative but to start again, smarting but smarter, and build a designed version in which these problems are solved.

Condition for Prototyping Model

- When user and developer are not sure
- Developer unsure of the efficiency of an algorithm.
- Prototyping paradigm begins with communication.
- Also called exploratory programming
- Effort of prototype is not wasted
- Faster than the Waterfall model
- High level of user involvement from the start
- Technical or other problems discovered early – risk reduced

8.3. People (Team)

Team Structure

The way a project team is structured can play a major role in how it functions. Team structure will probably be adjusted at each stage to meet the developing environment of the project. Our project team structure is **Controlled Decentralized (CD)**. This team structure is combination of hierarchical (CC) and democratic (DD). The reason our group decided this team structure is every team members can respond very quickly to changes as project develops. It is very important to have a team leader which can monitor the progress of the team, keep all team members up-to-date on project, and if required make adjustments to the team members' tasks. We will rotate team leader until every team members get one opportunity to be a responsible and gain skills.

This model can also be described as **"Team of peers"**. To make this concept to work, one needs to understand and support the roles and dynamics of the team members. Rather than being directly responsible for the day-to-day project direction and tracking, the project manager becomes a facilitator. This is the right choice for a small, high-powered, business-design team, and it is unlikely to work for a large applications development team. The reason for this is that smaller groups can be managed more efficiently on a “one-to-one” basis. This would be much harder to achieve in a large development teams, which would more benefit communicating through various committees and layers of management.

8.3.1. Management Reporting and Communication

For the project there are three team members, which are responsible for every thing. There should be at least one team leader, which can monitor the progress on the team, keep all team members up-to-date on project and if required make adjustments to the teams members' tasks. Team leader roll should alternate once, where every team member gain opportunity to be project management. Team members should attend meeting twice a week with presence of team leader. The project must divide into equally three team members. However, there should be weekly updates on the project from each team member. Therefore, if one team member fall behinds on his/her delivery date, there will be supplementary help available from other team members.

Team meeting is going to be schedule at the same time and days that are set according to every ones available time. All team members should be responsible of reporting individual tasks. During meeting there is going to be discussion about the design, the implementation, and concerns regarding the system. In case, if team leader is not able to attend, then team members must report the team leader all the activities happened during meeting. Every member of the team should report via e-mail, phone calls.

If there is any concern or problem regarding this project, the team members should report it during meeting in personal, by e-mail or phone calls. If it can't solve within team then team leader should contact with associated person. If any team member is going to be absence, they should notify the team leader in two weeks advance.

9. Work Breakdown Structure

9.1. Process (WBS)

The work breakdown structure of the PROJECT BANK is as follows

- Meeting with Relevant Person
- Decide time for data collection
- Design questions for interview
- Develop Prototype Model
- Design feasibility Analysis
- Project Costing
- Managed Risk
- Design Prototype Screen
- Design Algorithm/Pseudo Code
- Design Data Flow Diagram (DFD)
- Design ERD
- Programming
- Testing
- Design Installation Guide & User manual

Process (WBS)

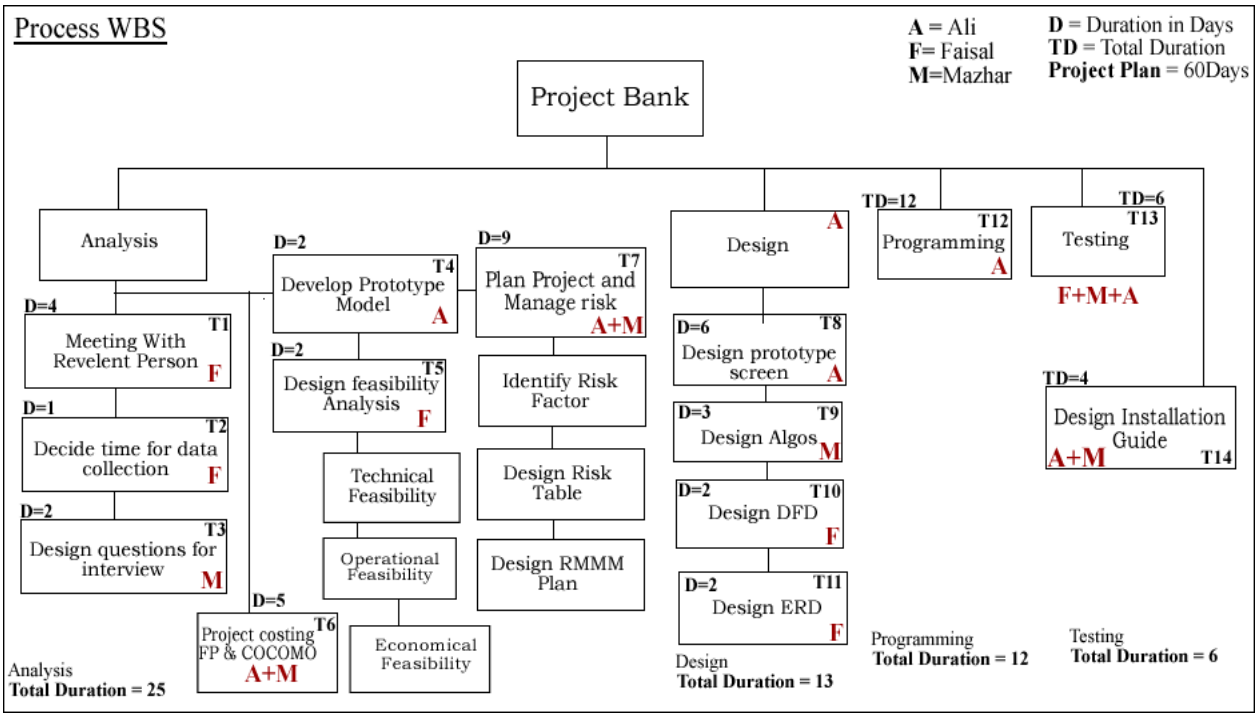


Diagram 9.1: Process WBS

9.2. Product (WBS)

The Product work break down structure is shows entities in “Project Bank” project

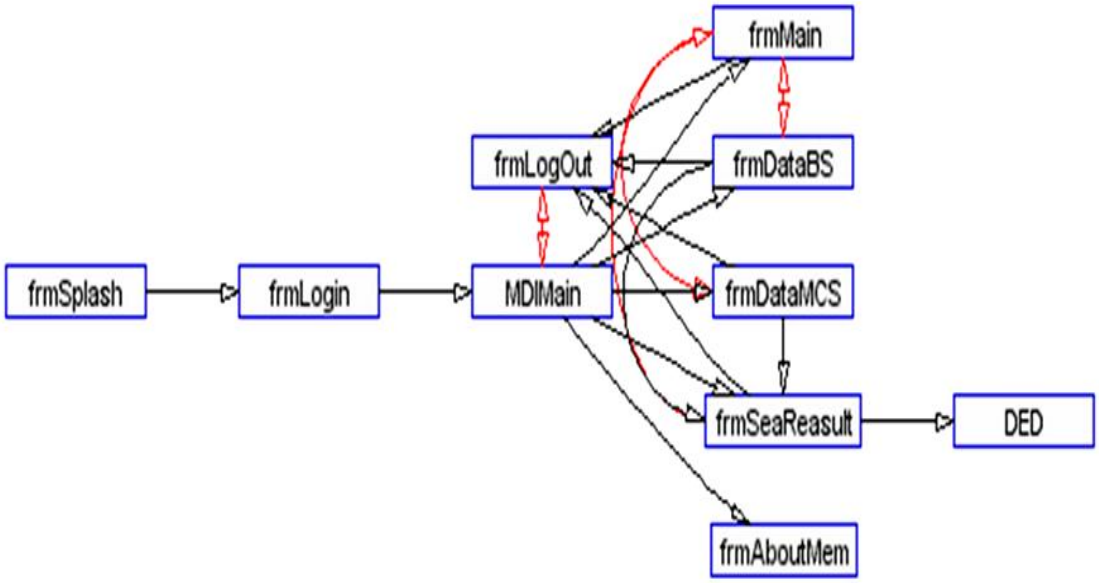


Diagram 9.2: Product WBS

10. Project Planning

10.1. Project Plan

The planning of our Project Bank (BB) is as follows,

Step-1

Project DURATION (PD) = (Total duration decide by CLIENT) - 1

Total duration decide by CLIENT = 2-March to 2- June

= **3 Months** (92 days)

Project DURATION (PD) = 92days – 20 days (for risk)

= **72 Days**

Total Number of weeks (TNW) PROJECT Duration (PD)

Total Number of DAYS (TND) in Project DURATION (PD)

Total Number of Days in Project Duration = 72 (including Sundays & Holidays)

Step-2

Total number of days (TND) = 72 days

Total number of holidays (TNH) = 12 days

(Sunday and others PUBLIC HOLIDAYS)

Actual Working Days (AWD)

AWD = total number of days (TND) –total number of holidays (TNH)

AWD= 72 - 12 Days

AWD = 60 (2 Months - 8 Weeks & 3 days)

Now distributes these 8 Weeks among team member equally or unequally as per team organization.

10.2. Timeline Chart – GANT

- A Gantt chart is a graphical representation of the duration of tasks against the progression of time. A Gantt chart is a matrix.
- The Gantt chart is constructed with a horizontal axis representing the total time span of the project, broken down into increments (days, weeks, or months).
- The Gantt chart is constructed with a vertical axis representing the tasks that make up the project.
- The Gantt chart is constructed with a graph area which contains horizontal bars for each task connecting the period start and period ending symbols.

The Gant Chart for our project is given below

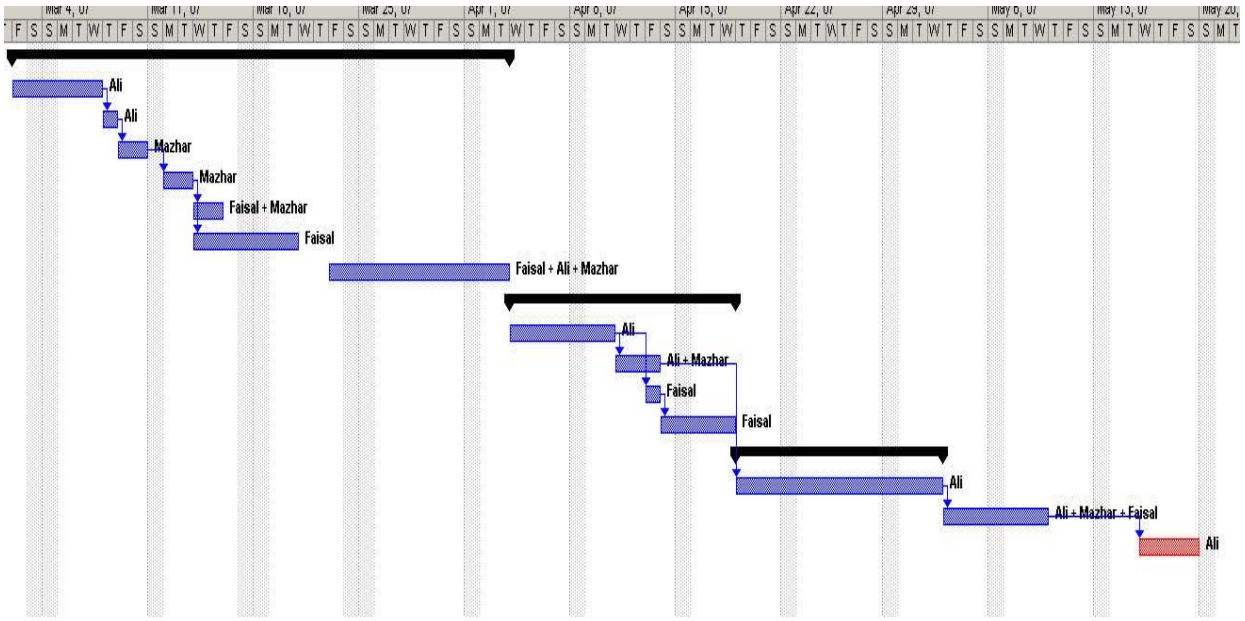


Figure 10.2: Timeline chart

10.3. PERT

Program evaluation and review technique (PERT) charts depict task, duration, and dependency information. Each chart starts with an initiation node from which the first task, or tasks, originates. If multiple tasks begin at the same time, they are all started from the node or branch, or fork out from the starting point. Each task is represented by a line which states its name or other identifier, & its duration. The other end of the task line is terminated by another node which identifies the start of another task, or the beginning of any slack time, that is, waiting time between tasks. Each task is connected to its successor tasks in this manner forming a network of nodes and connecting lines. The chart is complete when all final tasks come together at the completion node. A PERT chart may have multiple parallel or interconnecting networks of tasks.

Task	Description	Duration	Dependencies
Analysis		25days	
T1	Meeting with Relevant Person	4	-
T2	Decide time for data collection	1	-
T3	Design questions for interview	2	T2
T4	Develop Prototype Model	2	T3
T5	Design feasibility Analysis	2	-
T6	Project Costing	5	T5
T7	Managed Risk	9	-
Design		13Days	
T8	Design Prototype Screen	6	-
T9	Design Algorithm/Pseudo Code	3	T8
T10	Design Data Flow Diagram (DFD)	2	T8
T11	Design ERD	2	T10
Implementation		12Days	
T12	Programming	12	T9
Testing		6Days	
T13	Alpha Testing	3	T12
	Beta Testing	3	
Design User manual		4Days	
T14	Design Installation Guide & User manual	4	T13

Table 10.3: Activity Chart

Pert Chart

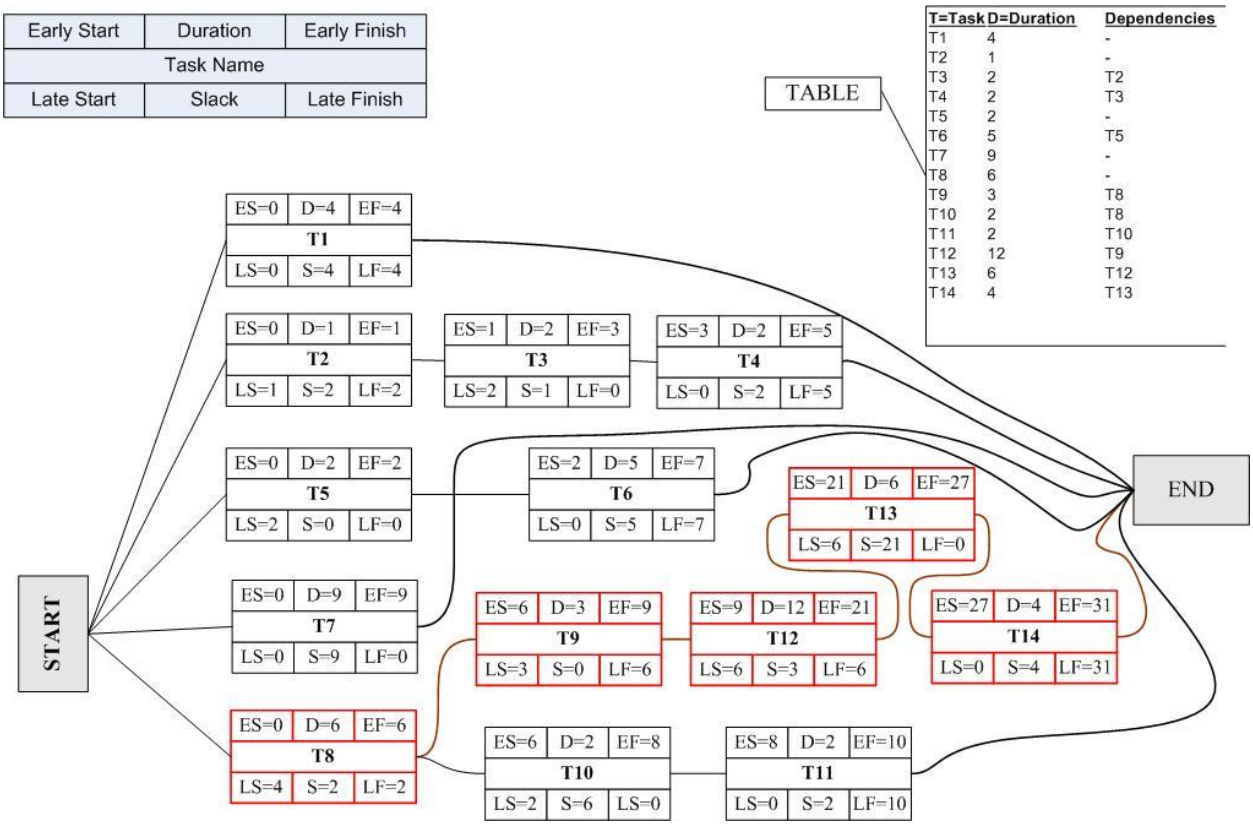


Diagram 10.3: PERT Chart

Critical Path = Longest time period required to complete the project, in our project the critical path is define as,

6 + 3 + 12 + 6 + 4 = 31days

Critical Time = **31days**

Critical Activities = Critical activities are those activities that lies on Critical path. In our project there are 5 critical activities that are **T8, T9, T12, T13, and T14**

10.4. CPM

The Critical Path Method (CPM) is one of several related techniques for doing project planning. CPM is for projects that are made up of a number of individual "activities." If some of the activities require other activities to finish before they can start, then the project becomes a complex web of activities.

CPM can help to figure out:

- how long your complex project will take to complete
- activities are "critical," meaning that they have to be done on time or else the whole project will take longer

Step 1: List the activities

We can start CPM analysis when we have a table showing each activity in our project. For each activity, we need to know which other activities must be done before it starts, and how long the activity takes.

See Table 10.2: Activity Chart

Step 2: Draw the diagram

Now we draw a network diagram of the project that shows which activities follow which other ones. This can be tricky. The analysis method we'll be using requires an "activity-on-arc" (AOA) diagram. An AOA diagram has numbered "nodes" that represent stages of project completion. You make up the nodes' numbers as you construct the diagram. You connect the nodes with arrows or "arcs" that represent the activities that are listed in the above table.

CPM – Activity on Arrow

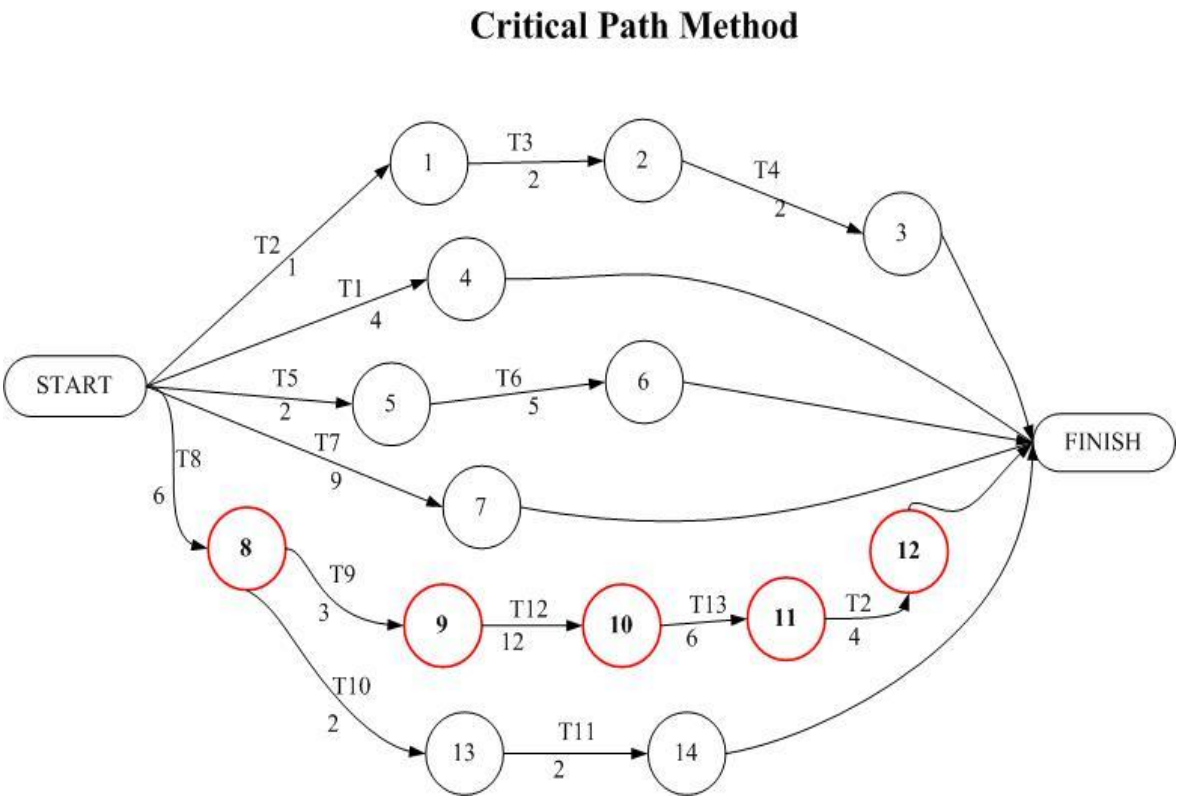


Diagram 10.4: CPM – Activity on Arrow

Critical Path = Longest time period required to complete the project, in our project the critical path is define as,

6 + 3 + 12 + 6 + 4 = 31days

Critical Time = **31days**

Critical Activities = Critical activities are those activities that lies on Critical path. In our project there are 5 critical activities that are **T8, T9, T12, T13, and T14**

11. Risk Management

The main focus of risk management is to understand the risks that are likely to occur and develop plans for dealing with them.

11.1 Risk Identification

Risk identification is a systematic attempt to specify the project plan, the following risk occurs in our projects, product and business risks.

- In which we can define what risks might occur, and then analyze them
- Be able to tell when a risk has taken place (which sets the stage for risk monitoring and mitigation)

Product size risks

- Degree of confidence in estimated size estimate?
- Estimated size of the product in LOC or FP?
- Number of users of the product?
- Estimated size of product in number of programs, files, transactions?

Business risks

- Reasonableness of delivery deadlines?
- Costs associated with late delivery?
- Costs associated with a defective product?

Development environment risks

- Is a software project management tool available?
- Is a software process management tool available?
- Are tools for analysis and design available?
- Are testing tools available and appropriate for the product to be built?
- Have members of the project teams received training in each of the tools?
- Is the software process used for other projects?

Process issue risks

- Are formal technical reviews of the requirements specification, design, and code conducted regularly?
- Are formal technical reviews of test procedures and test cases conducted regularly?
- Are the results of each formal technical review documented, including defects found and resources used?

Staff size and experience

- Are the best people available?
- Do the people have the right combination of skills?
- Are enough people available?
- Is staff committed for entire duration of the project?
- Will some staff be working only part time on this project?
- Does staff have the right expectations about the job at hand?
- Have staffs received necessary training?

Technical issue risks

- Are specific methods used for software analysis?
- Do you use a specific method for data and architecture designs?
- Are tools used to create software prototypes?
- Are software tools used to support the testing process?

Technology risks

- Is the technology to be built new to your company?
- Do the customer requirements demand the creation of new algorithms, input or output technology?

Additional Risks

- Effort is greater than estimated (per line of code, function point, module, etc.)
- Budget cuts upset project plans
- Are the best people available
- Planning is too poor to support the desired development speed
- Facilities are crowded, noisy, or disruptive
- Are local experts available to answer questions about the tools
- Customer insists on new requirements
- Does the customer have a solid idea of what is required

- Additional requirements are added
- Effect of this product on company revenue
- Costs associated with late delivery
- Team members do not work together efficiently
- Problem team members are not removed from the team, damaging overall team motivation
- Personnel work slower than expected

11.2 Risk Analysis

Three main steps can be used to analyze the software risk

- **Probability of Risk:**

First, a probability of the occurrence of a particular risk is estimated; i.e. risk as very low, low, moderate, high or very high

- **Impact:**

Second, the impact of the project of the particular risk should be estimated; i.e. risk as negligible, marginal, critical and catastrophic

- **Overall Risk:**

In figuring out the overall risk, consider how this risk may impact other on the project, and make a note of them (risks are rarely stand-alone, interrelationships often exist).

Risk Analysis Table

Risk Name	Category	Probability	Impact
Product Size Risk			
Degree of confidence in estimated size estimate?	PS	50%	3
Estimated size of the product in LOC or FP?	PS	30%	1
Number of users of the product?	PS	25%	1
Estimated size of product in number of programs, files, transactions?	PS	10%	3
Business Risk			
Reasonableness of delivery deadlines?	BU	20%	3
Costs associated with late delivery?	BU	40%	2
Costs associated with a defective product?	BU	40%	2
Development Risk			
Is a software project management tool available?	DE	60%	2
Is a software process management tool available?	DE	55%	3
Are tools for analysis and design available?	DE	50%	3
Are testing tools available and appropriate for the product to be built?	DE	30%	2
Have members of the project teams received training in each of the tools?	DE	65%	3
Is the software process used for other projects?	DE	10%	2

Process issue risk			
	Category	Probability	Impact
Are formal technical reviews of the requirements specification, design, and code conducted regularly?	PD	25%	1
Are formal technical reviews of test procedures and test cases conducted regularly?	PD	20%	1
Are the results of each formal technical review documented, including defects found and resources used?	PD	20%	3
Staff Size and Experienced			
Are the best people available?	SS	50%	2
Do the people have the right combination of skills?	SS	20%	3
Are enough people available?	SS	15%	4
Is staff committed for entire duration of the project?	SS	10%	4
Will some staff be working only part time on this project?	SS	10%	3
Does staff have the right expectations about the job at hand?	SS	15%	3
Have staffs received necessary training?	SS	30%	2
Technical issue risk			
Are specific methods used for software analysis?	TI	25%	2
Are tools used to create software prototypes?	TI	45%	2
Are software tools used to support the testing process?	TI	30%	3
Technology risks			
Is the technology to be built new to your company?	TE	55%	3
Do the customer requirements demand the creation of new algorithms, input or output technology?	TE	20%	3

Additional Risks			
	Category	Probability	Impact
Effort is greater than estimated (per line of code, function point, module, etc.)	AD	40%	2
Budget cuts upset project plans	AD	30%	2
Planning is too poor to support the desired development speed	AD	20%	3
Facilities are crowded, noisy, or disruptive	AD	10%	3
Are local experts available to answer questions about the tools	AD	35%	3
Customer insists on new requirements	AD	15%	2
Does the customer have a solid idea of what is required	AD	50%	2
Additional requirements are added	AD	40%	2
Effect of this product on company revenue	AD	10%	1
Visibility of this product to senior management	AD	20%	2
Costs associated with late delivery	AD	5%	1
Team members do not work together efficiently	AD	15%	2
Problem team members are not removed from the team, damaging overall team motivation	AD	15%	2
Personnel work slower than expected	AD	10%	2

Table 11.2(a): Risk Analysis

Categories	Impact
PS - Product size risks **BU** - Business risks **DE** - Development environment risks **PI** - Process issue risks **SS** - Staff size and experience **TI** - Technical issue risks **TE** - Technology risks **AD** - Additional Risks	**1**-Catastrophic **2**-Critical **3**-Marginal **4**-Negligible

Table 11.2(b): Risk Categories & Impact

11.3 RMMM Table

Risk Name	Category	Probability	Impact	RMMM
Product Size Risk				
Degree of confidence in estimated size estimate?	PS	50%	3	11.3.1-1
Estimated size of the product in LOC or FP?	PS	30%	1	11.3.1-2
Number of users of the product?	PS	25%	1	11.3.1-3
Estimated size of product in number of programs, files, transactions?	PS	10%	3	11.3.1-4
Business Risk				
Reasonableness of delivery deadlines?	BU	20%	3	11.3.1-5
Costs associated with late delivery?	BU	40%	2	11.3.1-6
Costs associated with a defective product?	BU	40%	2	11.3.1-7
Development Risk				
Is a software project management tool available?	DE	60%	2	11.3.1-8
Is a software process management tool available?	DE	55%	3	11.3.1-9
Are tools for analysis and design available?	DE	50%	3	11.3.1-10
Are testing tools available and appropriate for the product to be built?	DE	30%	2	11.3.1-11
Have members of the project teams received training in each of the tools?	DE	65%	3	11.3.1-12
Is the software process used for other projects?	DE	10%	2	11.3.1-13

Process issue risk				
	Category	Probability	Impact	RMMM
Are formal technical reviews of the requirements specification, design, and code conducted regularly?	PI	25%	1	11.3.1-14
Are formal technical reviews of test procedures and test cases conducted regularly?	PI	20%	1	11.3.1-15
Are the results of each formal technical review documented, including defects found and resources used?	PI	20%	3	11.3.1-16
Staff Size and Experienced				
Are the best people available?	SS	50%	2	11.3.1-17
Do the people have the right combination of skills?	SS	20%	3	11.3.1-18
Are enough people available?	SS	15%	4	11.3.1-19
Is staff committed for entire duration of the project?	SS	10%	4	11.3.1-20
Will some staff be working only part time on this project?	SS	10%	3	11.3.1-21
Does staff have the right expectations about the job at hand?	SS	15%	3	11.3.1-22
Have staffs received necessary training?	SS	30%	2	11.3.1-24
Technical issue risk				
Are specific methods used for software analysis?	TI	25%	2	11.3.1-25
Are tools used to create software prototypes?	TI	45%	2	11.3.1-26
Are software tools used to support the testing process?	TI	30%	3	11.3.1-27
Technology risks				
Is the technology to be built new to your company?	TE	55%	3	11.3.1-28
Do the customer requirements demand the creation of new algorithms, input or output technology?	TE	20%	3	11.3.1-29

Additional Risks				
	Category	Probability	Impact	RMMM
Effort is greater than estimated (per line of code, function point, module, etc.)	AD	40%	2	11.3.1-30
Budget cuts upset project plans	AD	30%	2	11.3.1-31
Planning is too poor to support the desired development speed	AD	20%	3	11.3.1-32
Facilities are crowded, noisy, or disruptive	AD	10%	3	11.3.1-33
Are local experts available to answer questions about the tools	AD	35%	3	11.3.1-34
Customer insists on new requirements	AD	15%	2	11.3.1-34
Does the customer have a solid idea of what is required	AD	50%	2	11.3.1-35
Additional requirements are added	AD	40%	2	11.3.1-36
Effect of this product on company revenue	AD	10%	1	11.3.1-37
Visibility of this product to senior management	AD	20%	2	11.3.1-38
Team members do not work together efficiently	AD	15%	2	11.3.1-39
Problem team members are not removed from the team, damaging overall team motivation	AD	15%	2	11.3.1-40
Personnel work slower than expected	AD	10%	2	11.3.1-41

Table 11.3: RMMM Table

Category

PS - Product size risks **BU** - Business risks

DE - Development Environment risks **PI** - Process issue risks

SS - Staff size and experience **TI** - Technical issue risks

TE - Technology risks **AD** - Additional Risks

Impact

1-Catastrophic **2**-Critical **3**-Marginal **4**-Negligible

Probability is the chance of the risk occurring. **Impact** is the effect of the risk occurring.

11.3.1 RMMM Solution

Reference	Risk Name	Solution
Product Size Risk		
11.3.1-1	Degree of confidence in estimated size estimate?	▪ Project planner must understand the scope of the software to be built and generate a proper estimate of its size. ▪ The planner must estimate the number and types (e.g. reuse, adding code, changing code, and deleting code) of modifications that must be accomplished.
11.3.1-2	Estimated size of the product in LOC or FP?	▪ The planner has properly estimated the size of the product to be built. ▪ The ability to translate size estimate into human effort and calendar time
11.3.1-3	Number of users of the product?	▪ No restriction for numbers of user of the product. ▪ The market value of the product should be increased.
11.3.1-4	Estimated size of product in number of programs, files, transactions?	▪ To solve this we must follow the testing at each level. ▪ We have to make algorithm firstly and also do prototyping to ensure about no of programs.

Business Risk		
11.3.1-5	Reasonableness of delivery deadlines?	▪ Before starting the project analyzes all aspect that deadline occur easily. ▪ Plan better strategy and review the whole work in daily bases.
11.3.1-6	Costs associated with late delivery?	▪ Every team members will not connected to any other projects. ▪ Do proper scheduling so the delivery date cannot be exceeded.
11.3.1-7	Costs associated with a defective product?	▪ Testing product in each phase, before delivery test the product. ▪ Before delivering, test the products and remove all the errors so that no defect should occur.
Development Risk		
11.3.1-8	Is a software project management tool available?	▪ Experience and Trained Team Selection. ▪ The project team has experience with the technology to be implemented.
11.3.1-9	Is a software process management tool available?	▪ Every team members must have the tools awareness. ▪ Software team has the right mix of skills.
11.3.1-10	Are tools for analysis and design available?	▪ Analyze what you need then hire the project. ▪ Arrange all the tools before starting the analysis phase.

11.3.1-11	Are testing tools available and appropriate for the product to be built?	▪ Hire the Outer team for inspection or test the product. ▪ The testing tools are according to the product to be built and for this the project domain is accurate.
11.3.1-12	Have members of the project teams received training in each of the tools?	▪ Every team member must have the tool awareness. ▪ The number of people on the project team must be adequate to do the job.
11.3.1-13	Is the software process used for other projects?	▪ Selecting Process Model on the Past project Experience. ▪ Decide the process model according to project duration.
Process issue risk		
11.3.1-14	Are formal technical reviews of the requirements specification, design, and code conducted regularly?	▪ Formal Technical Review conducted regularly thought the project. All issues are recorded and tracked. ▪ Formal technical methods are applied to uncover the errors in the design.
11.3.1-15	Are formal technical reviews of test procedures and test cases conducted regularly?	▪ Formal Technical Review for test procedures is conducted. ▪ Reviews are taken on daily basis.
11.3.1-16	Are the results of each formal technical review documented, including defects found and resources used?	▪ Each formal technical review documented including defects found and resources used.

Staff Size and Experienced		
11.3.1-17	Are the best people available?	▪ Required more Trained & experienced Peoples on Tools. ▪ Conduct interviews before selecting the team members.
11.3.1-18	Do the people have the right combination of skills?	▪ People with different skills make good combination. ▪ The team that is chosen has the experience in different fields of software engineering.
11.3.1-19	Are enough people available?	▪ According to the project enough people is available. ▪ Assign a backup staff member for every critical problem.
11.3.1-20	Is staff committed for entire duration of the project?	▪ All team members work according to the project planning. ▪ Organize project team so that they work effectively.
11.3.1-21	Will some staff be working only part time on this project?	▪ Every team members will not connected to any other projects. ▪ The part time workers are not allowed in doing the project.
11.3.1-22	Does staff have the right expectations about the job at hand?	▪ Staffs have right expectations about the job; clear the responsibilities about the job. ▪ Meet with staff and conduct reviews of all work and give them motivation about their job.

11.3.1-23	Have staffs received necessary training?	▪ Every team members must have the tools awareness. ▪ Conduct 2 to 3 months training if required necessary.
Technical issue risk		
11.3.1-24	Are specific methods used for software analysis?	▪ Used method for analysis is appropriate ▪ For better analyzing conduct interviews and meeting with the customer and analyze his need.
11.3.1-25	Are tools used to create software prototypes?	▪ Multiples tools used to create good looking prototypes.
11.3.1-26	Are software tools used to support the testing process?	▪ Testing tools are not available, test by manually. ▪ We must arrange these before starting the testing phase.
Technology risks		
11.3.1-27	Is the technology to be built new to your company?	▪ Using technology is not new. ▪ If the technology used is new then trained the staff.
11.3.1-28	Do the customer requirements demand the creation of new algorithms, input or output technology?	▪ Customer doesn't require any algorithm and either input or output. ▪ Communicate with the customer in a timely manner so that he is fully involved in the definition of requirement.

Additional Risks		
11.3.1-29	Effort is greater than estimated (per line of code, function point, module, etc.)	▪ If Effort is greater then estimated then required increase HR. ▪ Increase the working days by including holidays to reach the estimate.
11.3.1-30	Budget cuts upset project plans	▪ Analyze the budget before starting the project. ▪ If project requirements are stable than budget can not be increase.
11.3.1-31	Planning is too poor to support the desired development speed	▪ Members are fully involved in the project and work according to the plan. ▪ Experience person must plan the project because if the project schedule slips the cost will increase.
11.3.1-32	Facilities are crowded, noisy, or disruptive	▪ Environment is well maintained, crowded environment effect the project. ▪ Interpersonal relationship among team members is also good.
11.3.1-33	Are local experts available to answer questions about the tools	▪ Local Expert must available. ▪ We have to make help by local experts.
11.3.1-34	Customer insists on new requirements	▪ Requirement are analyzed and signed by customer before start the project. ▪ Every document must be sign off by the customer so that he is

		satisfy with the development of the project.
11.3.1-35	Does the customer have a solid idea of what is required	▪ Customer has some idea what is required. ▪ Communicate with the customer in a timely manner so that he is fully involved in the definition of requirement.
11.3.1-36	Additional requirements are added	▪ To fulfill the customer needs the team members must communicate with the customer in a timely manner. ▪ Satisfy the end user with the product so that no additional requirements are needed.
11.3.1-37	Effect of this product on company revenue	▪ Company revenue is partially increased. ▪ The return of investment for project can give better effect to company revenue.
11.3.1-38	Visibility of this product to senior management	▪ It is the responsibility of the project manager to involve the senior management in the whole progress. ▪ Senior management's support and involvement is must in the product success.
11.3.1-39	Team members do not work together efficiently	▪ All team members will communicate with each other after the completion of each function

		▪ Interpersonal relationship among team members is also good.
11.3.1-40	Problem team members are not removed from the team, damaging overall team motivation	▪ Discussion, analyze the problem and motivation is required to solve the problem. ▪ The team leader has the ability to solve the problem of the team members.
11.3.1-41	Personnel work slower than expected	▪ Establish methods to monitor and control work defined by plan. ▪ Give instructions and check the progress on daily basis.

Table 11.3.1: RMMM Solution/Alternatives

11.4. Overview of Risk Monitoring, Mitigation, Management

Risk mitigation, monitoring, and management help us pre-determine any possible major risks that may occur during development of this software. The Requirements Specification and the System Specification will be reviewed and analyzed to determine the major risks of developing this software. Each major risk found will be further analyzed to determine its overall impact upon the system. These risks will be recorded and a method will be devised to determine the best course of action if the risk should occur. Certain risks will have preventative measures devised for them. This is to reduce the possibility of more severe risks from occurring. All risks that could occur will have a specified method to handle the risk. This is to ensure that if a risk does occur, there is predetermined path to follow when attempting to manage the risk.

11.5. PERT According to Expected time

PERT is a network analysis technique used to estimate project duration when there is a high degree of uncertainty about the individual activity duration estimates.

T1	Meeting with Relevant Person
T2	Decide time for data collection
T3	Design questions for interview
T4	Develop Prototype Model
T5	Design feasibility Analysis
T6	Project Costing
T7	Managed Risk

T8	Design Prototype Screen
T9	Design Algorithm/Pseudo Code
T10	Design Data Flow Diagram (DFD)
T11	Design ERD
T12	Programming
T13	Testing
T14	Design Guide & User manual

Activity/Task	Optimistic (a)	Most likely (m)	Pessimistic (b)	Expected time te
T1	4	3	4	3.33
T2	1	1	1	1
T3	2	1	2	1.33
T4	2	2	2	2
T5	2	2	3	2.16
T6	5	4	6	4.5
T7	9	8	10	8.5
T8	6	5	6	5.33
T9	3	3	4	3.16
T10	2	2	2	2
T11	2	2	2	2
T12	12	11	13	11.5
T13	6	5	7	5.5
T14	4	2	4	2.66

Table 11.5a: RMMM Expected Time Calculation

- PERT uses **probabilistic time estimates**:
- Duration estimates based on using optimistic, most likely, and pessimistic estimates of activity durations, or a three-point estimate.

Formula to calculate the expecting time

PERT weighted average = optimistic time + 4X most likely time + pessimistic time

6

$$\mathbf{te} = \frac{a + 4m + b}{6}$$

Calculations – Expected Time

For T1:

$t_e = 4+(4*3)+4/6$

$t_e = 3.3$

For T2:

$t_e = 1+(4*1)+1/6$

$t_e = 1$

For T3:

$t_e = 2+(1*4)+2/6$

$t_e = 1.33$

For T4:

$t_e = 2+(2*4)+2/6$

$t_e = 2$

For T5:

$t_e = 2+(2*4)+3/6$

$t_e = 2.16$

For T6:

$t_e = 5+(4*4)+6/6$

$t_e = 4.5$

For T7:

$t_e = 9+(8*4)+10/6$

$t_e = 8.5$

For T8:

$t_e = 6+(5*4)+6/6$

$t_e = 5.33$

For T9:

t_e =3+(3*4)+4/6

t_e =3.16

For T10:

t_e =2+(4*2)+2/6

t_e =2

For T11:

t_e =2+(4*2)+2/6

t_e =2

For T12:

t_e =12+(11*4)+13/6

t_e =11.5

For T13:

t_e =6+(5*4)+7/6

t_e =5.5

For T14:

t_e =4+(4*2)+4/6

t_e =2.66

Formula to calculate the Standard Deviation

PERT weighted average = pessimistic time - optimistic time => b – a / 6

6

Denoted by capital **S**

Calculations – Standard deviation

For T1:

S = b – a / 6

S = 4 – 4 / 6

S= 0

For T2:

S = b – a / 6

S = 1 – 1 / 6

S= 0

For T3:

S = b – a / 6

S = 2– 2 / 6

S= 0

For T4:

S = b –a / 6

S = 2 – 2 / 6

S= 0

For T5:

S = b – a / 6

S = 3 – 2 / 6

S= 0.16

For T6:

S = b – a / 6

S = 6 – 5 / 6

S= 0.16

For T7:

S = b – a / 6

S = 10 – 9 / 6

S= 0.16

For T8:

S = b – a / 6

S = 6 – 6 / 6

S= 0

For T9:

S = b – a / 6

S = 4 – 3 / 6

S= 0.16

For T10:

S = b –a / 6

S = 2 – 2 / 6

S= 0

For T11:

S = b – a / 6

S = 2 – 2 / 6

S= 0

For T12:

S = b – a / 6

S = 13 – 12 / 6

S= 0.16

For T13:

S = b – a / 6

S = 7 – 6 / 6

S= 0.16

For T14:

S = b – a / 6

S = 4 – 4 / 6

S= 0

Activity/Task	Optimistic (a)	Most likely (m)	Pessimistic (b)	Standard deviation S = b – a / 6
T1	4	3	4	0
T2	1	1	1	0
T3	2	1	2	0
T4	2	2	2	0
T5	2	2	3	01.6
T6	5	4	6	01.6
T7	9	8	10	01.6
T8	6	5	6	0
T9	3	3	4	01.6
T10	2	2	2	0
T11	2	2	2	0
T12	12	11	13	01.6
T13	6	5	7	01.6
T14	4	2	4	0

Table 11.5b: RMMM Standard deviation Calculation

11.5.1. PERT CHART (According to Expected time)

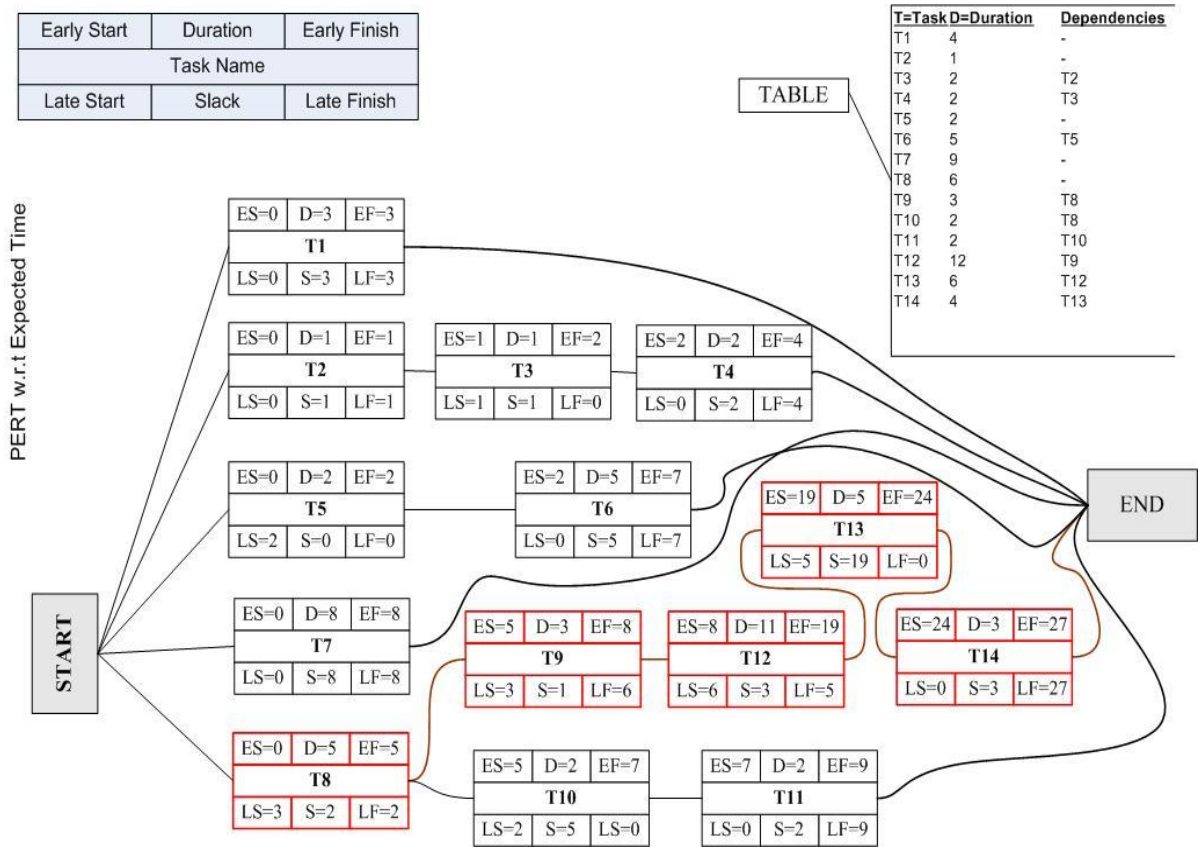

Early Start
Duration
Early Finish
Task Name
Late Start
Slack
Late Finish
TABLE
T=Task D=Duration Dependencies
T1 4 -
T2 1 -
T3 2 T2
T4 2 T3
T5 2 -
T6 5 T5
T7 9 -
T8 6 -
T9 3 T8
T10 2 T8
T11 2 T10
T12 12 T9
T13 6 T12
T14 4 T13
PERT w.r.t Expected Time
START
END
ES=0 D=3 EF=3 T1 LS=0 S=3 LF=3
ES=0 D=1 EF=1 T2 LS=0 S=1 LF=1
ES=1 D=1 EF=2 T3 LS=1 S=1 LF=0
ES=2 D=2 EF=4 T4 LS=0 S=2 LF=4
ES=0 D=2 EF=2 T5 LS=2 S=0 LF=0
ES=2 D=5 EF=7 T6 LS=0 S=5 LF=7
ES=19 D=5 EF=24 T13 LS=5 S=19 LF=0
ES=0 D=8 EF=8 T7 LS=0 S=8 LF=8
ES=5 D=3 EF=8 T9 LS=3 S=1 LF=6
ES=8 D=11 EF=19 T12 LS=6 S=3 LF=5
ES=24 D=3 EF=27 T14 LS=0 S=3 LF=27
ES=0 D=5 EF=5 T8 LS=3 S=2 LF=2
ES=5 D=2 EF=7 T10 LS=2 S=5 LS=0
ES=7 D=2 EF=9 T11 LS=0 S=2 LF=9

Diagram 11.5.1: PERT (Accepted Time)

Critical Path = **5 + 3 + 11 + 5 + 3 = 27 days**

Critical Time = **27 days**

Critical Activities = Critical activities are those that lies in Critical path. In our project there are 5 critical activities that are **T8, T9, T12, T13, and T14**

12. Analysis Tools

12.1. MS Visio 2003

Visio 2003 also includes features that enable you to:

Find exactly the shape you need

Use the Find Shape feature to quickly locate shapes installed on your hard drive, as well as shapes available online. The search user interface (UI) works just like a Visio stencil: Simply drag the desired shape into your diagram.

Create project diagrams from existing data

Create a timeline or Gantt chart automatically from Microsoft Project data to help you better communicates key milestones to stakeholders.

Charts and Graphs

The Charts and Graphs template provides ready-made shapes for graph elements, such as x-axis, y-axis, normal curve, and exponential curve shapes, so that they can easily be included in documents and presentations. The Charts and Graphs template can be used to create bar graphs, line graphs, pie charts, and graphs with special effects.

Project Schedule

A number of diagrams in Visio — including calendars, and Gantt and program evaluation and review technique (PERT) charts — can be used to plan and manage projects in an organization. The Visio 2003 calendar has graphics and color schemes, associated tasks and appointments, and a rich stencil of Calendar Art shapes for embellishment. Gantt charts can be created for project management, task management, schedules, timetables, agendas, project life cycles, and goal setting. PERT charts can be created for organizing tasks and establishing timeframes, as well as for showing dependent tasks.

Timeline

The Timeline diagram can be used to quickly create horizontal or vertical timelines that illustrate milestones and intervals over the life of a project or process. Visio timelines can display intervals of years, quarters, months, weeks, days, hours, minutes, and seconds.

12.2. MS Project 2003

Microsoft Project Standard 2003 Trial software enables you to evaluate the product on your system before making a purchase decision. Trial versions contain all Microsoft Project features, but can only be used for a limited time.

Add-In for Visio diagramming

Create a Work Breakdown Structure (WBS) chart in Visio from Project 2003 data.

Gantt Charts, Calendars, Network Diagrams, and Task Sheets

Present project data in versatile views.

Additional project templates

Jump-start common projects and promote consistency.

Interactive, Step-By-Step Planning Aide

Set up and manage projects effectively with the Project Guide.

Multiple Baselines

Track status over project life cycle with 11 full baselines.

Add-In for comparing project files

Compare two versions of the same project and report the results.

Phase # 2

Project Design

13. Screen Layouts (GUI's)

13.1. Splash Screen

Figure 13.1: Splash Screen

Description

The splash screen is displayed first when u click on exe file of the project, it will contain the flash intro file with percentage bar when the percentage is complete the next form will open

13.2. Login

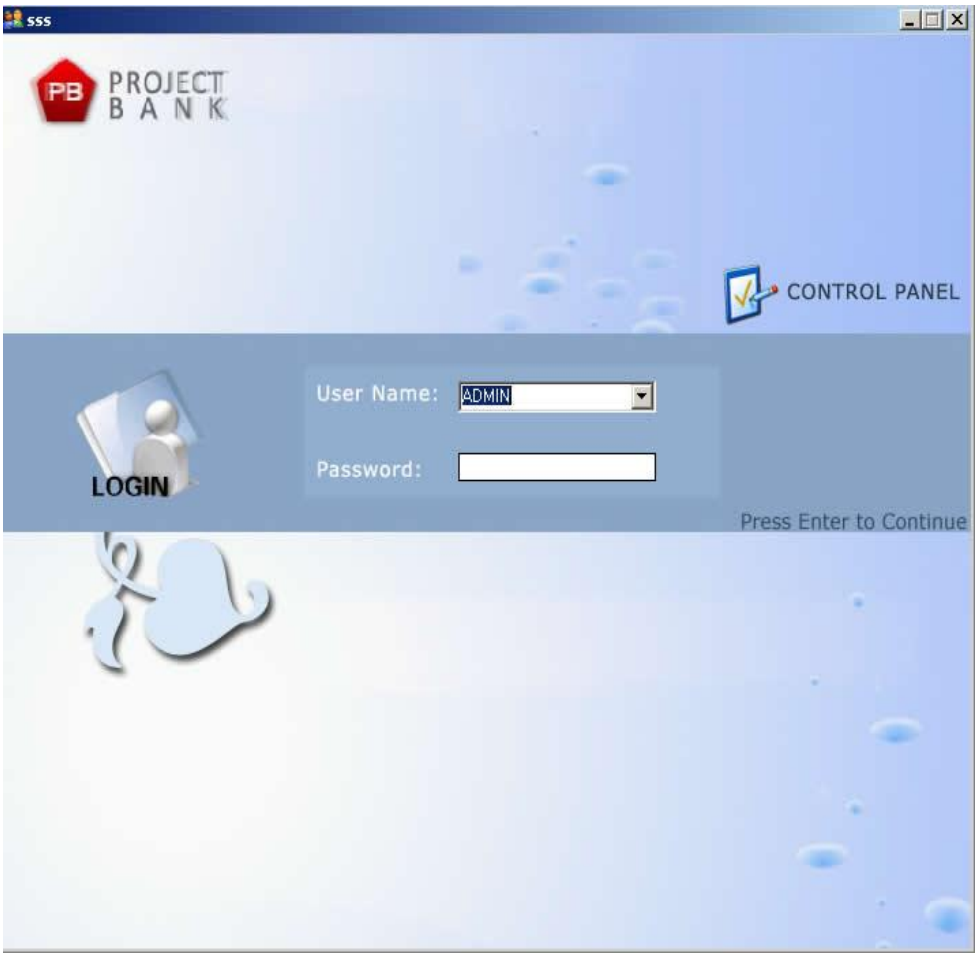


Figure 13.2: Login Screen

Description

The Login Page is displayed after the Splash screen, Login Screen required username and password to enter the application, and the username is fixed as Admin and required password(arms) only when the correct password is enter the Menu Form will be displayed.

13.3. Main Screen

Figure 13.3: Main Screen

Description

The MDI Form or Menu Form has all the operation that user want do to navigate the application. First the view menu contains the option like program selection; search Record, Log Out and exit

Similarly the help menus contain the user manual displayed in html format and the video tutorial that guide how to use the application, including other information like About team members and about group members.

13.4. Program Selection

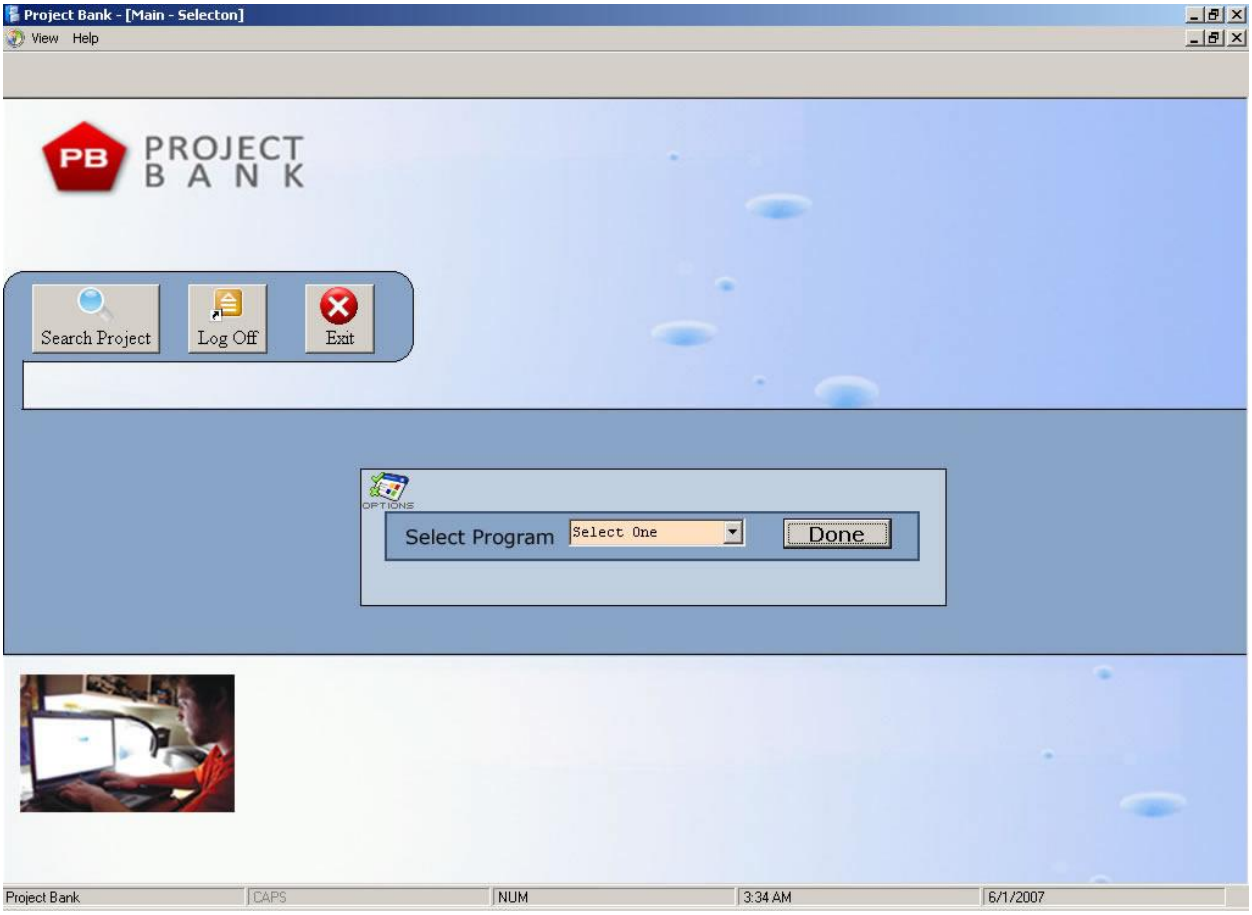


Figure 13.4: Program Selection

Description

This Program Selection screen, program selection means that you have two options BS & MCS chose one and click on done to go the information of that program student's project. If you click with out choosing any one then the error message box is displayed.

This Program screen also has the option to jump on to the search project, Log Out the application and exit application. Logout means that you have not accesses any thing and re-enter the password.

13.5. Search Record

Project Bank - [Search]
View Program Category Help
PROJECT BANK
Search
Search by Name
Search by Supervisor
Search by Project Title
Search by Technology
Home
Search
ASP
C#.NET
VB.NET
HTML
Java
JSP
PHP
Perl
groupnumber ProjectSupervisor ProjectTitle GroupName Batch CourseName FrontEnd BackEnd
1 Asif Ali Blod Bank ARMS 2007 Software Eng VB-6.0 MsAccesses BS
2 Asif Ali Project Bank NSS 2007 Software Eng VB-6.0 MsAccesses BS
3 Uzma Afzal Inventory System ABS 2007 Software Eng VB.Net SQL Server BS
4 Usma Afzal Billing System The Ideal 2007 Software Eng ASP.Net MsAccesses BS
5 Farhan Shafiq Trafic Control The Professional 2006 Advance AI VB.Net Oracle 9i BS
6 Farhan Shafiq Online Billing ISS 2006 Mas Connumication C#.Net MsAccesses BS
7 Kashif Laeeque Banking Debut Creative 2006 Software Eng ASP.Net MsAccesses BS
8 Kashif Laeeque GPRS Creator 2006 Software Eng VB.Net MsAccesses BS
9 Kashif Rifat Hotel Management Core Developer 2005 Software Eng C#.Net SQL BS
10 Kashif Rifat Airline Reservation ... Mind Group 2005 Software Eng VB.Net SQL SERVER BS
11 Asif Mugal PERT Tool Progressive 2004 Software Eng VB.Net ORACLE BS
1 Asif Ali Blod Bank ARMS 2007 Software Eng VB-6.0 MsAccesses MCS
Project Bank
CAPS
NUM
3:04 AM
5/27/2007

Figure 13.5: Program Selection

Description

Search Record Screen searches the existing project by the option like Search by Name, Search by Supervisor, Search by Project title, Search by Technology.

When the from load all the text box is disabled to search, to search click the option button (any one) the text box is allowed to enter the name then click enter or search button to displayed the search result. Be careful that the any text field is not allowed numerics.

13.6. Logout

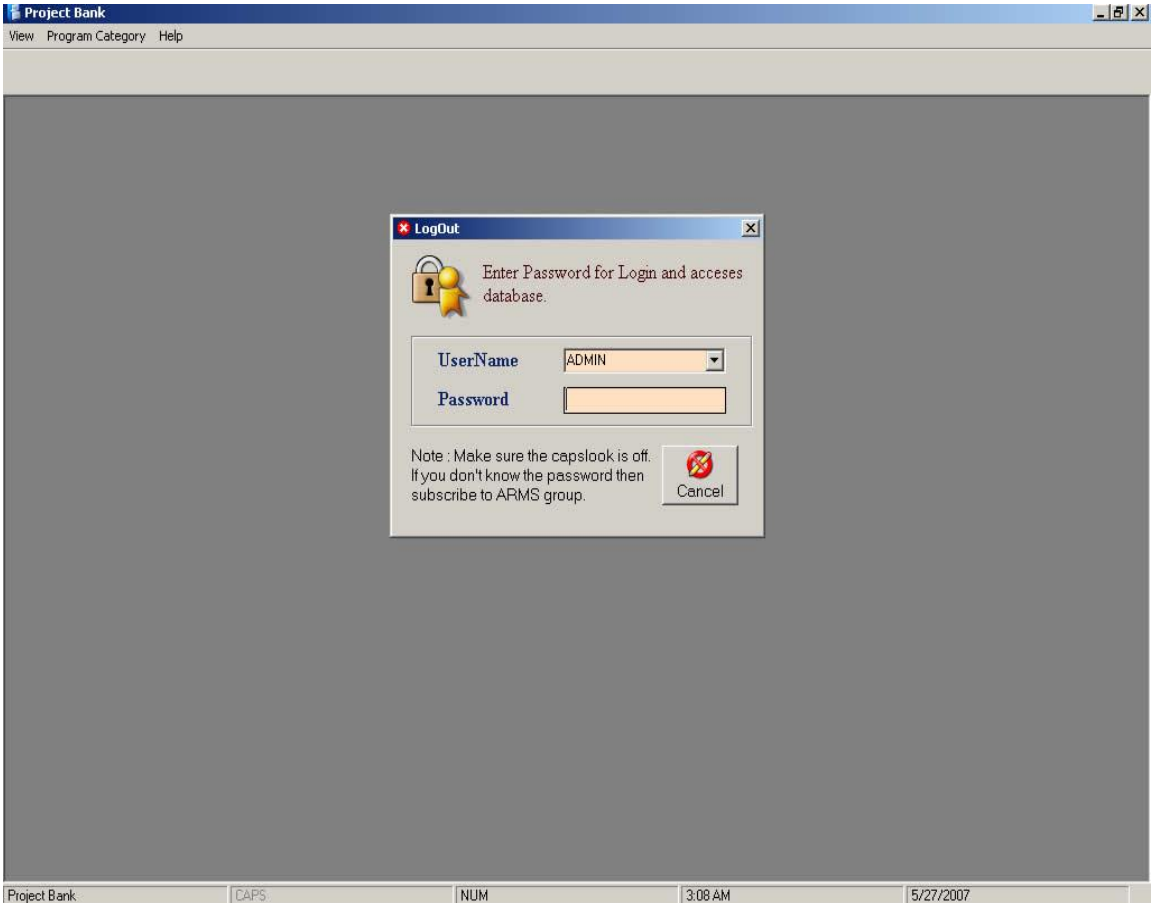


Figure 13.6: Log out Screen

Description

The log out screen means that temporary security for your application such as Log Off in windows. When you click on log off the screen will displayed and you entered only password to accesses the application.

13.7. BS Records

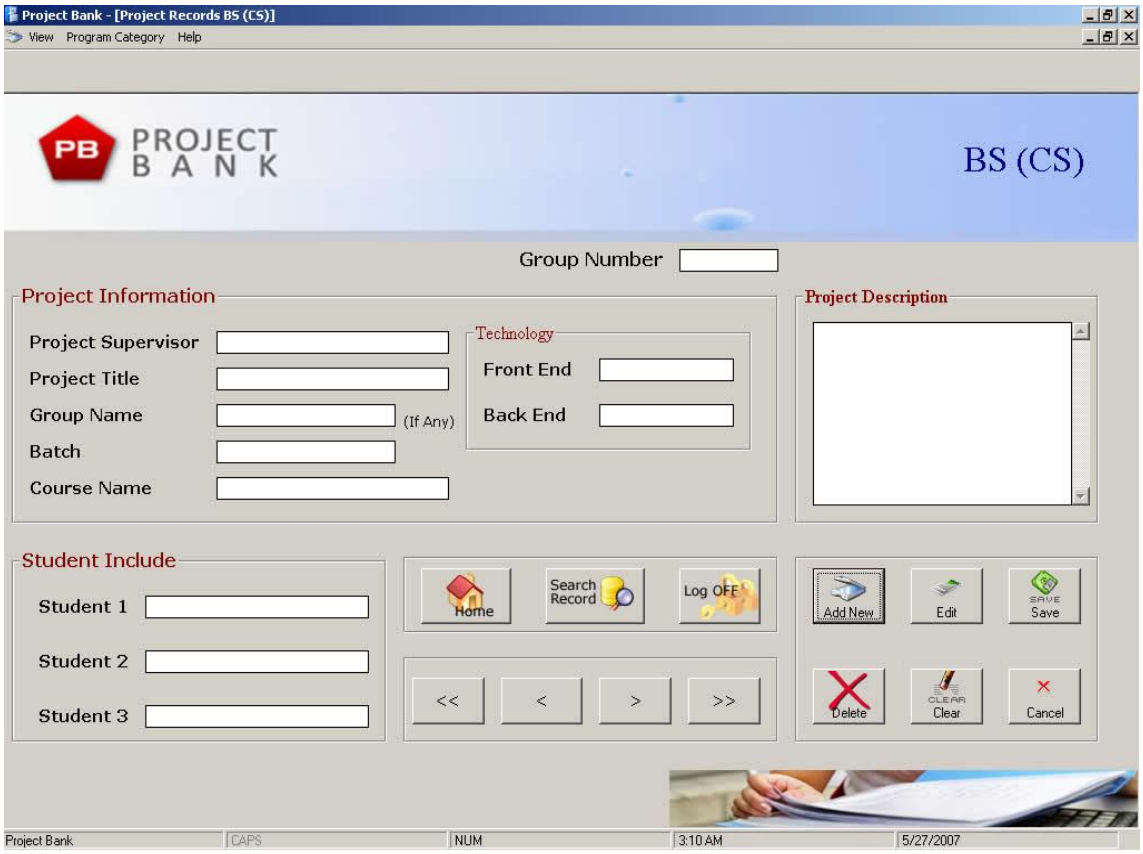


Figure 13.7: BS Records

Description

BS Record Form contain many information regarding the details of project all the fields are required if you want go without fill the nay field the warn message will displayed and until you fill the required field you no o to the next field, and similarly the fields with character required character only and fields with numeric required numeric only.

When the form displayed all the text filed will be disabled if you want to add or edit record then click on Add New or Edit buttons then the fields will active/enabled.

Arrow Buttons: To Change the current record means go thorough the record as first, previous, next and last.

ADD New: If you want to add new record all the fields will enabled and insert the project details then click on save to save the record.

Edit: If you want to edit existing current record then click on edit then again all fields will enabled and enter the records then click save.

Delete: To delete the current record

Cancel: If you click on Add or Edit but you would not to add or edit record then click cancel button other wise it will generator some errors.

Including jump option like Home, Search record and Logoff.

13.8. MCS Records

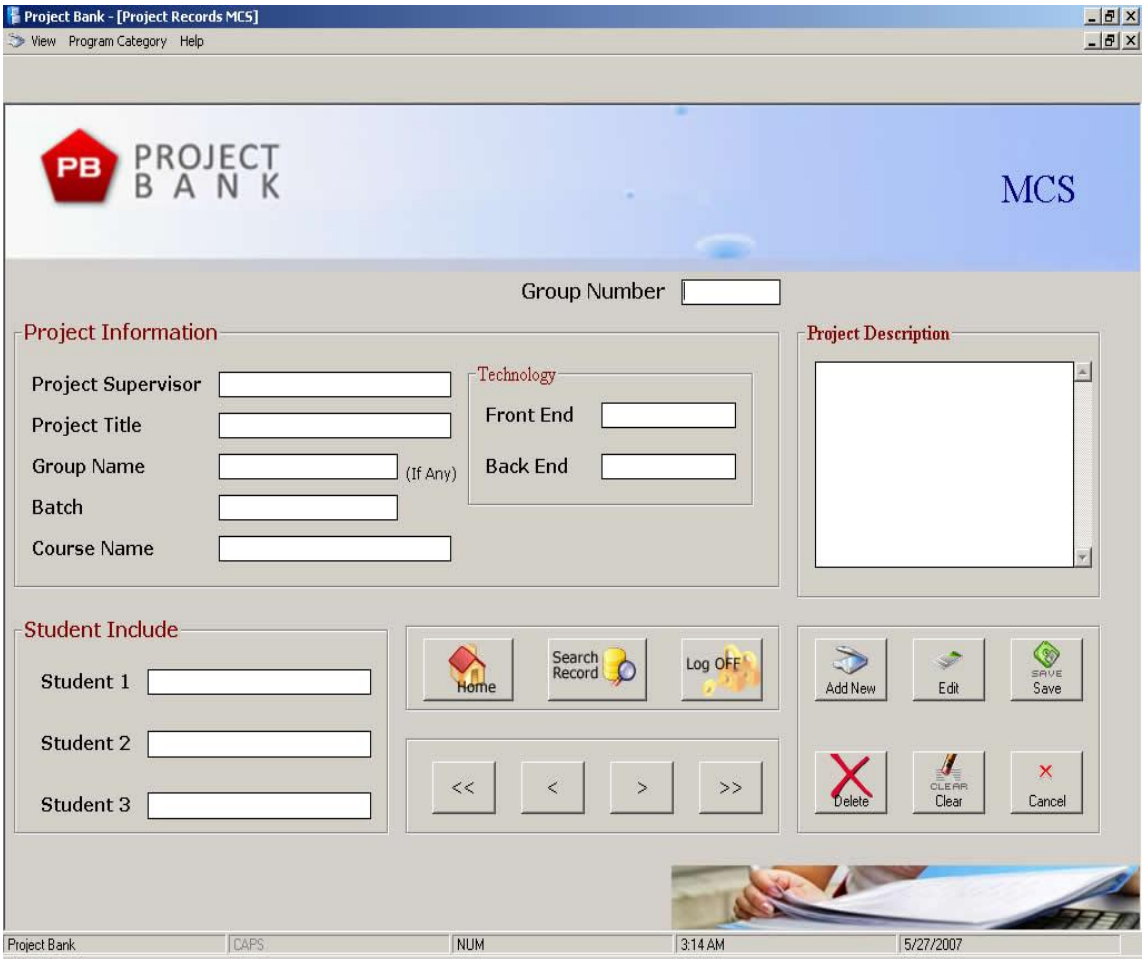


Figure 13.8: MCS Records

Description

MCS Record Form contain many information regarding the details of project all the fields are required if you want go without fill the nay field the warn message will displayed and until you fill the required field you no o to the next field, and similarly the fields with character required character only and fields with numeric required numeric only.

When the form displayed all the text filed will be disabled if you want to add or edit record then click on Add New or Edit buttons then the fields will active/enabled.

Arrow Buttons: To Change the current record means go thorough the record as first, previous, next and last.

ADD New: If you want to add new record all the fields will enabled and insert the project details then click on save to save the record.

Edit: If you want to edit existing current record then click on edit then again all fields will enabled and enter the records then click save.

Delete: To delete the current record

Cancel: If you click on Add or Edit but you would not to add or edit record then click cancel button other wise it will generator some errors.

Including jump option like Home, Search record and Logoff.

13.9. Help

One of the options of the help menu is user guide manual that displayed in html format that helps the user how to use the application

Then the video tutorial option in help menus displayed the video tutorial that in flash file swf format so its approx 10 to 15 min and in detail including the example how to add, edit, delete and search the records.

Figure 13.9: Help Options

13.9.1. About Project Bank

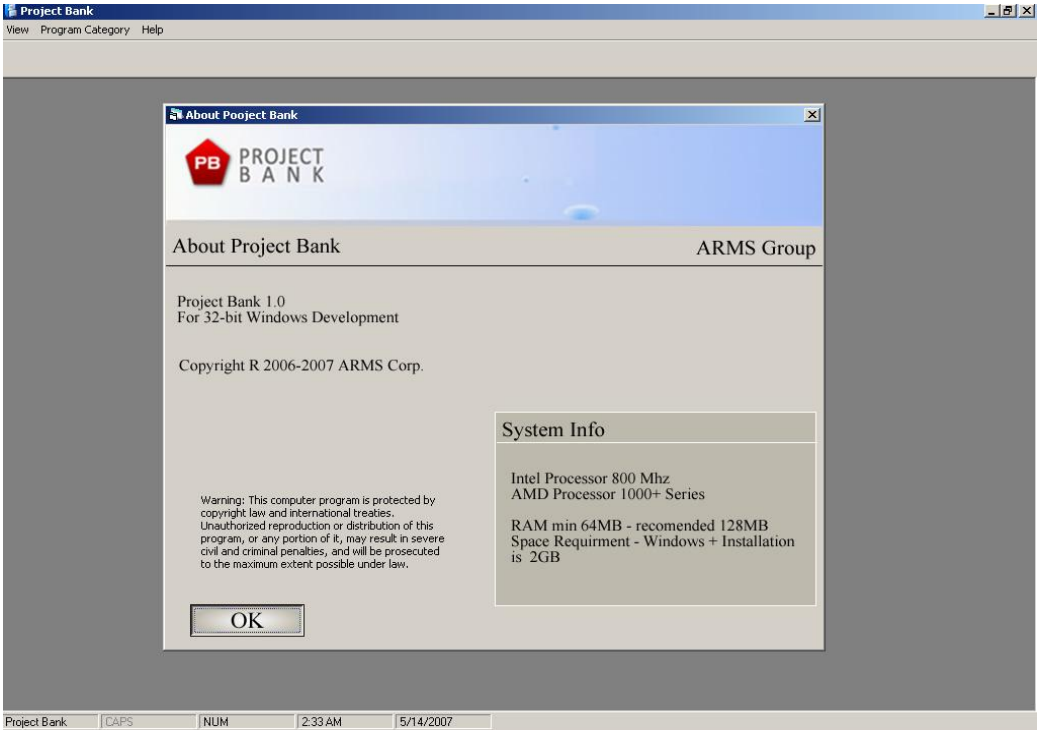

Project Bank
View Program Category Help
About Pooject Bank
PROJECT BANK
About Project Bank
ARMS Group
Project Bank 1.0
For 32-bit Windows Development
Copyright R 2006-2007 ARMS Corp.
System Info
Intel Processor 800 Mhz
AMD Processor 1000+ Series
RAM min 64MB - recomended 128MB
Space Requirment - Windows + Installation is 2GB
Warning: This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
OK
Project Bank
CAPS
NUM
2:33 AM
5/14/2007

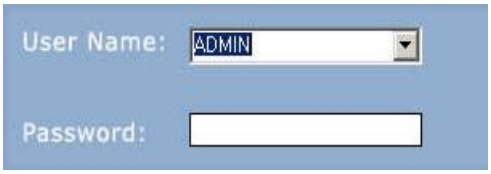
Figure 13.9.1: About Project Bank Screen

Description

The screen displayed the information about project bank application, information like version, group name; system info and copyright are included, the click ok to exit he form

14. Pseudo Code

14.1. Login



Step 1: get "User Name"

Step 2: get "Password"

Step 3: Check username & password

Step 4: If password & username correct then

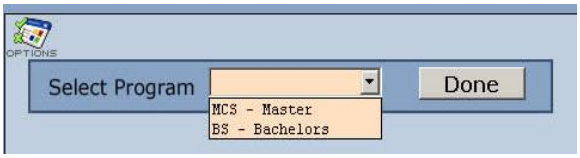
Goes to MDI form

Else show Invalid username & password

End if

Step 5: Exit

14.2. Program Selection



Click Event of Done Button

Step 1: If Program selection: = MCS – Master *then*

Show Form DataMCS **OR**

Program Selection := BS – Bachelors *then*

Show Form BSData

Click Event of Buttons

Step 2: If User click Search Project button *then*

Show Form Search

Step 3: If User click Log Off button *then*

Show Form Logoff

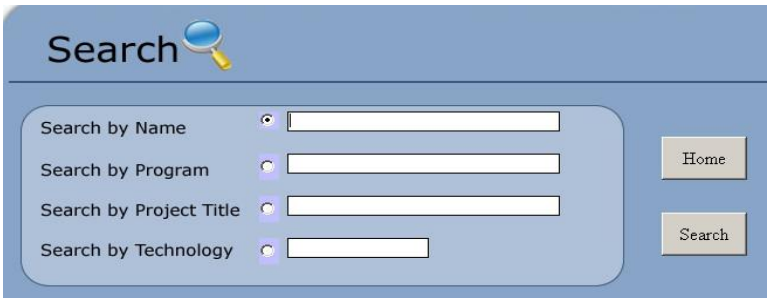
Step 4: If User clicks about button *then*

Show Form About

Step 4: If User click Exit button *then*

Exit Current form (search)

14.3. Search Record



Click Event of Home Button

Step 1: When Click Home button *then*

Show the Program Selection Form

Click Event of Search Button

Step 2: If Selection is search by name *then*

Show Search result

Step 3: If Selection is search by program *then*

Show Search result

Step 4: If Selection searches by project title *then*

Show Search result

Step 5: If Selection searches by technology *then*

Show Search result

14.4. BS Records / MCS Records

Home: When Click Home button *then*

Show the Program Selection Form

Search: If User click Search Record button *then*

Show Form Search

Logoff: If User click Logoff button *then*

Show re-login Screen

First, Previous, Next, Last:

If User click on First, Previous, Next, Last button *then*

move the records

Add New:

Step 1: If User click Add New button *then*

Unlock all Fields

Disabled Delete, Edit buttons

Filled all required fields

Step 2: then click save to save record

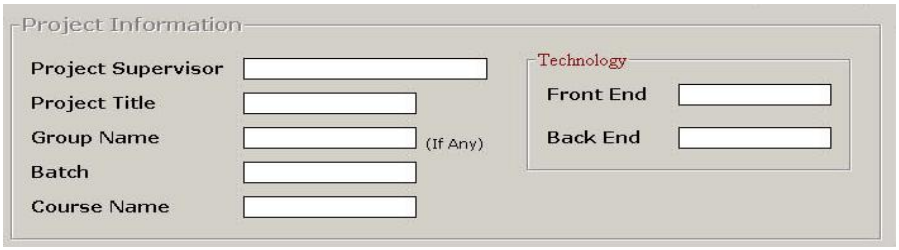
Step 3: click Cancel to if not add any record

Edit:

Step 1: If User click Edit button *then*
Unlock all Fields
Disabled Delete, Add New buttons
Step 2: then click save to update record
Step 3: click Cancel to if not add any record

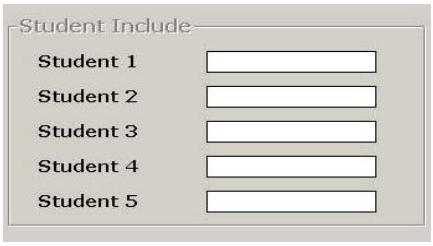
Delete: If User clicks on Delete button *then*
Delete the current record
Clear: If User clicks on Clear button *then*
Clear all fields when ad new or

14.5. BS Records / MCS Records – Validation Algorithms



Character Fields:

Step 1: If entered value is Numeric *then*
Display error "Numeric not allowed"
Step 2: If the Field is empty *then*
Display error "Insert (Text Filed Name) Name Please"
Step 3: If Entered Name character Length is less then 3 *then*
Display error "You Should Enter At least Three Char"



Numeric Fields:

Step 1: If entered value is Character *then*
Display error "This is Not A Valid Value, Insert Numeric Value"

Step 2: If the Field is empty *then*
Display error "This is Not A Valid Value, Insert Numeric Value"

For Batch Field

Step 3: If Entered Name character Length is Greater then 4 *then* Display error "You Should Enter 4 decimal only: Example 2007"

15. DFD

15.1. Context Level

Context Diagram below showed data flows between a generalized Project bank system within the domain and the other entities and abstractions with which it communicates.

1. After the student submit their proposal and approved by project supervisor then,
2. The student will submit their project to the supervisor
3. The supervisor review and check their project and satisfy with their project.
4. Then the system manage record of the project that student submitted
5. Then the system performs the operation like view and search record, update & edits records.

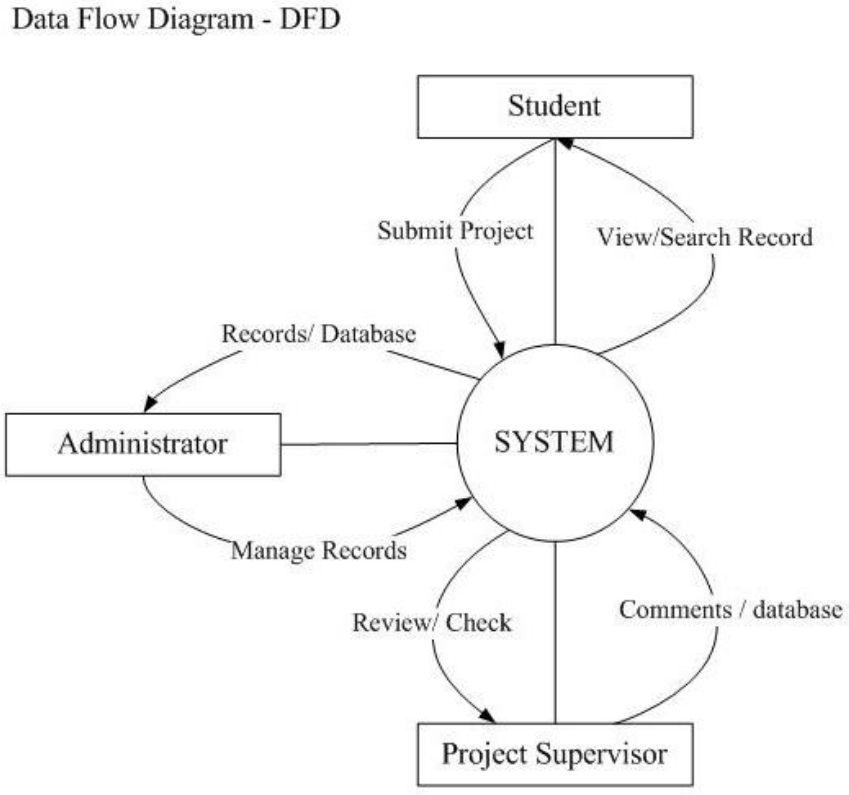


Diagram 15.1: DFD-Context Level

15.2. DFD- 1st Level

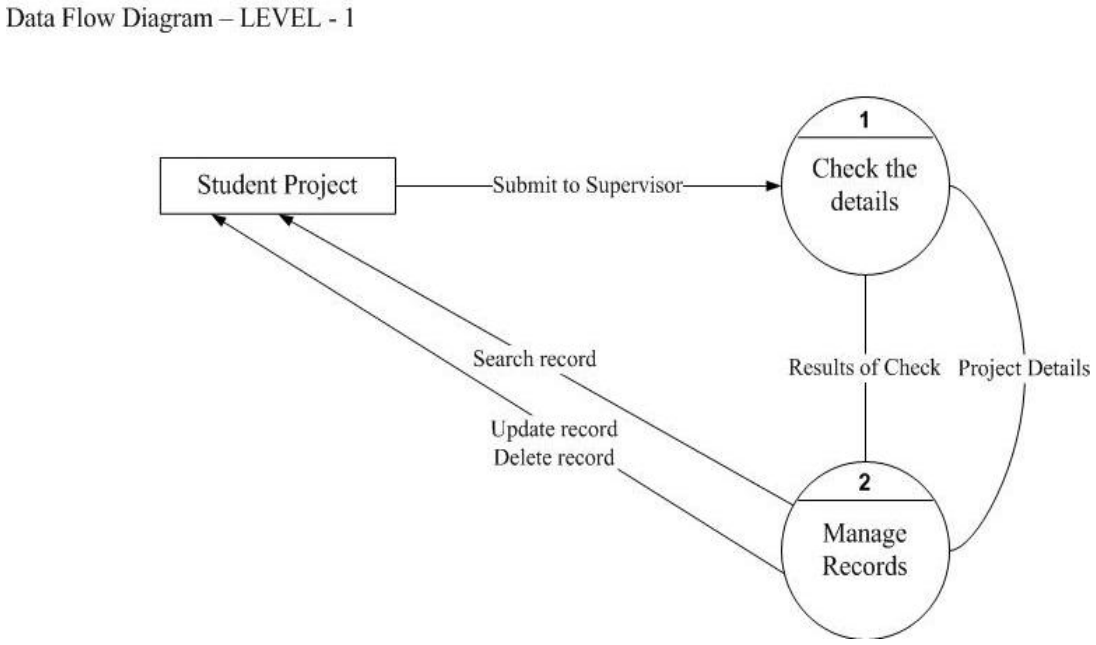


Diagram 15.2: DFD-1st Level

15.3. DFD- 2nd Level

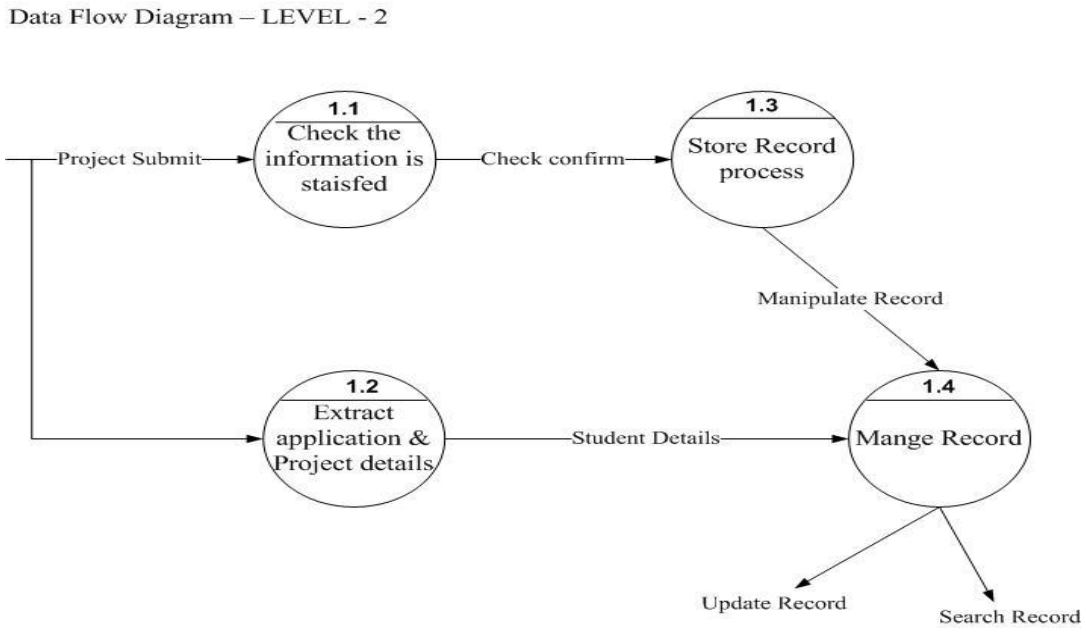


Diagram 15.2: DFD-2nd Level

16. Data Dictionary

16.1. Table BS

Fields	Data Type	Max Length	Required
Group Number	Number	10	yes
Project Supervisor	Text	28	yes
Project Title	Text	28	yes
Group Name	Text	25	No
Batch	Number	9	Yes
Course Name	Text	25	No
Front End	Text	20	yes
Back End	Text	20	yes
Program	Text	3	yes
Project Description	Text	255	optional
Student 1	Text	25	yes
Student 2	Text	25	optional
Student 3	Text	25	optional

Table 16.1: Data Dictionary BS Table

16.2. Table MCS

Fields	Data Type	Max Length	Required
Group Number	Number	10	yes
Project Supervisor	Text	28	yes
Project Title	Text	28	yes
Group Name	Text	25	No
Batch	Number	9	Yes
Course Name	Text	25	No
Front End	Text	20	yes
Back End	Text	20	yes
Program	Text	3	yes
Project Description	Text	255	optional
Student 1	Text	25	yes
Student 2	Text	25	optional
Student 3	Text	25	optional
Student 4	Text	25	optional

Table 16.2: Data Dictionary MCS Table

17. ERD

This report focuses on the conceptual design of the database. In this section an enterprise relationship diagram (ER diagram) helps convey how the entities of the database and their attributes relate to each other. The ER Diagram was created using Visio software, and is the framework from which the rest of the process is based on.

The Entity Relationship Diagram below is to show the relationship between different data in the Project Bank system, and how data from different objects relate to each other.

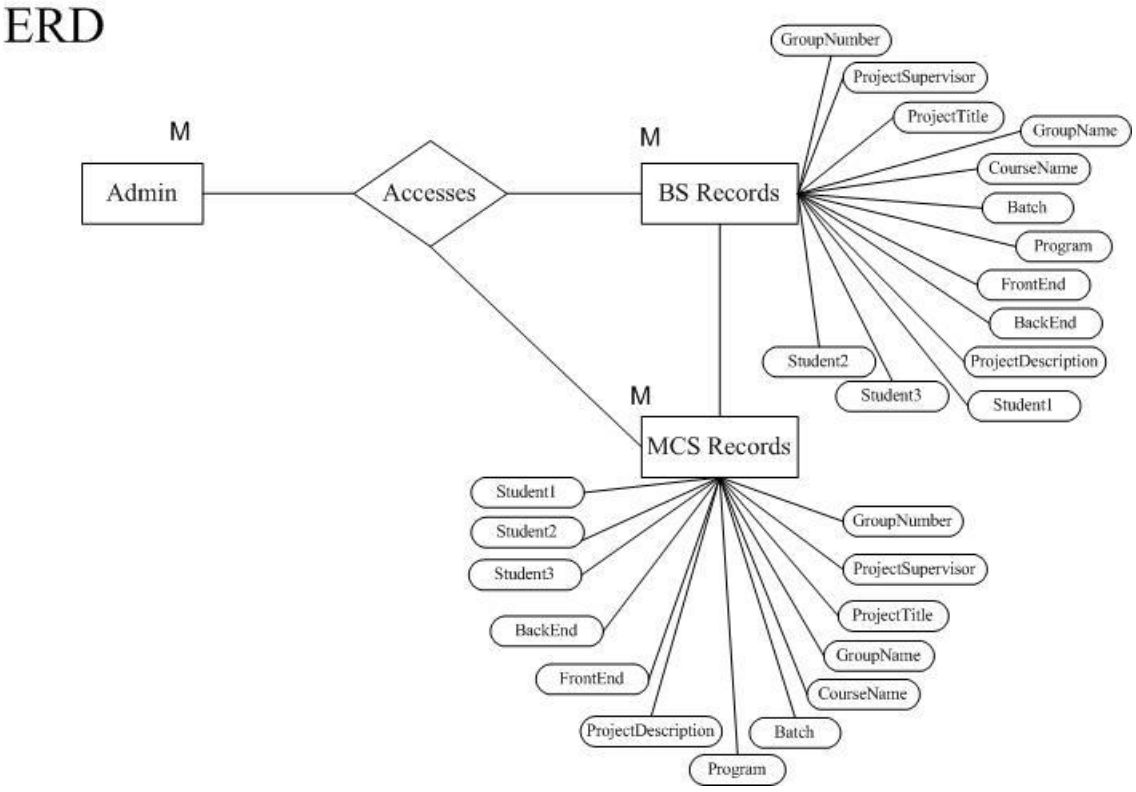


Diagram17.0: Entity Relationship Diagram (ERD)

18. Use Case Diagram

UML Use Case Diagrams can be used to describe the functionality of a system in a horizontal way. That is, rather than merely representing the details of individual features of your system, Use Case Diagrams can be used to show all of its available functionality. It is important to note, though, that Use Case Diagrams are fundamentally different from sequence diagrams or flow charts because they do not make any attempt to represent the order or number of times that the systems actions and sub-actions should be executed.

Use Case Diagrams have only 4 major elements: The actors that the system you are describing interacts with, the system itself, the use cases, or services, that the system knows how to perform, and the lines that represent relationships between these elements.

We should use 'USE CASE' Diagrams to represent the functionality of our system from a top-down perspective.

Description

Representing a project bank application, first, we would create a separate diagram for the top-level services, and then we would add new use cases that make up the top-level ones. There is a uses edge from "Department/ admin" have to "Manage Record" and "Department/admin" from "Addition and Deletion" from the record also "Department/admin" perform "Search the from the record.

Similarly, the diagram indicates that in order to add student detail of project to the system, the student information is check and the project and group members' information must be recorded.

USE CASE Diagram

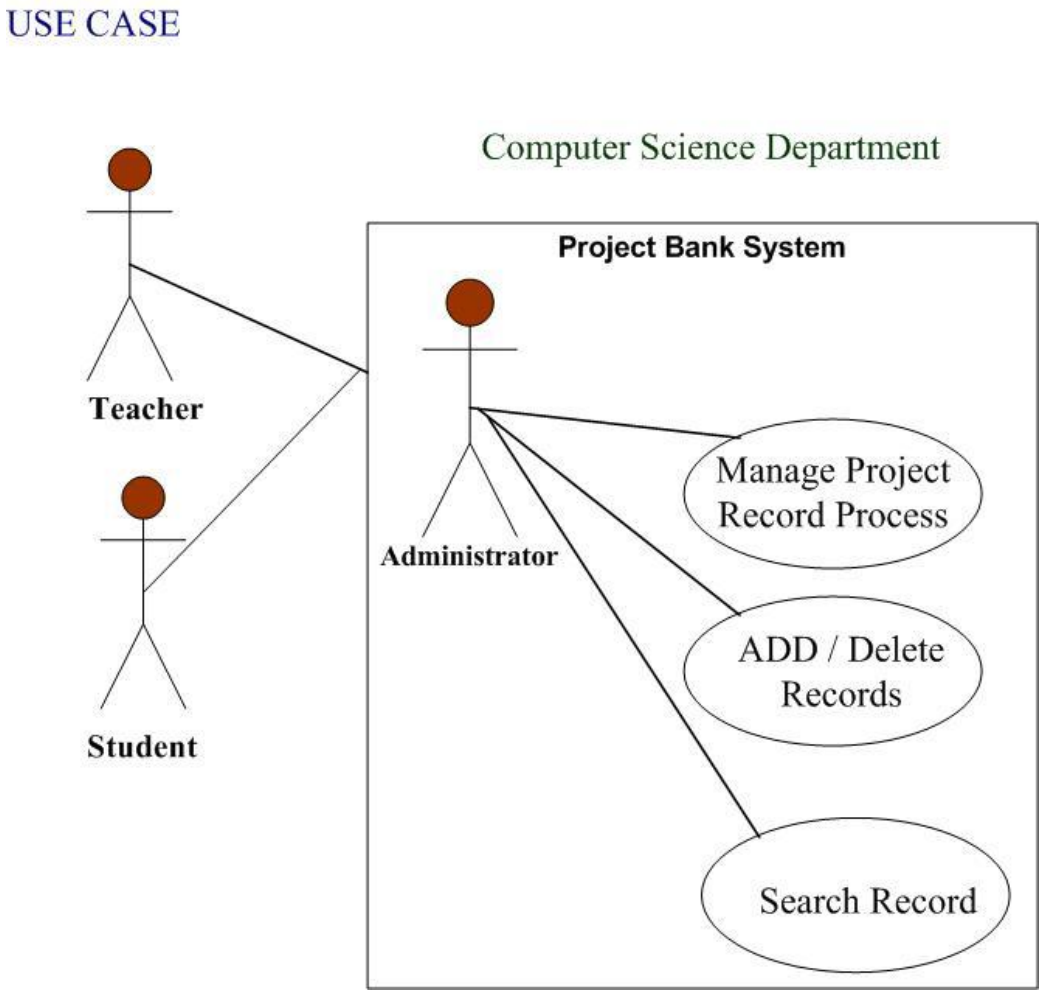


Diagram 18.0: Use Case

19. Design Tools

19.1. Microsoft Visual Basic 6.0

Microsoft Visual Basic 6.0 is chosen because the ease of using it to design the interface for our system. Visual Basic is user friendly as it is a Graphic User Interface style. The end user will find it easy to use the system with a friendly interface.

19.2. Macromedia Fireworks

We will use fire works to make interactive look and editing picture and logos. Fireworks were designed from the ground up specifically for the task of creating Web site layouts and graphics in an efficient and flexible manner. It is a creative powerhouse that can really do it all, from the creative visual design stages to the slicing, optimization and export of finished Web graphics. With Fireworks there's no need to switch between different applications to accomplish different tasks and its tool set is tailored to the needs of Web designers.

19.3. MS SQL SERVER 2003 (Back End Tools)

Uses

Access is used by small businesses, within departments of large corporations, and hobby programmers to create *ad hoc* customized desktop systems for handling the creation and manipulation of data. Access can also be used as the database for basic web based applications hosted on Microsoft's Internet Information Services and utilizing Microsoft Active Server Pages ASP. More complex web applications may require tools like PHP/MySQL or ASP/Microsoft SQL Server.

Features

One of the benefits of Access from a programmer's perspective is its relative compatibility with SQL—queries may be viewed and edited as SQL statements, and SQL statements can be used directly in Macros and VBA Modules to manipulate Access tables. Users may mix and use both VBA and "Macros" for programming forms and logic and offers object-oriented possibilities.

MSDE (Microsoft SQL Server Desktop Engine) 2000, a mini-version of MS SQL Server 2000, is included with the developer edition of Office XP and may be used with Access as an alternative to the Jet Database Engine.

Development

Access allows relatively quick development because all database tables, queries, forms, and reports are stored in the database. For query development, Access utilizes the Query Design Grid, a graphical user interface that allows users to create queries without knowledge of the SQL programming language. In the Query Design Grid, users can "show" the source tables of the query and select the fields they want returned by clicking and dragging them into the grid. Joins can be created by clicking and dragging fields in tables to fields in other tables. Access allows users to view and manipulate the SQL code if desired.

The programming language available in Access is, as in other products of the Microsoft Office suite, Microsoft Visual Basic for Applications. Two database access libraries of COM components are provided: the legacy Data Access Objects (DAO), only available with Access, and the new ActiveX Data Objects (ADO).

20. Programming

Forms Includes

- Splash Screen Form
- Login Form
- MDI Form
- Program Selection Form
- Searching From
- BS Data From
- MCS Data Form
- About Group Members Form
- About Project bank Form
- Log Out Form

Information about Splash Screen Form

Static: (Splash Form)

- Code = 141
- Comment = 2
- Blank = 5
- Procedures = 3
- Variables = 2

Information about Login Screen Form

Static:

- Code = 234
- Comment = 1
- Blank = 5
- Procedures = 3
- Variables = 1

Information about MDI Form

Static:

- Code = 196
- Comment = 0
- Blank = 1
- Procedures = 9
- Variables = 1

Information about Main Form (program Selection)

Static:

- Code = 196
- Comment = 0
- Blank = 1
- Procedures = 9
- Variables = 1

Information about Main Form (program Selection)

Static:

- Code = 151
- Comment = 0
- Blank = 1
- Procedures = 6
- Variables = 1

Information about Search Form

Static:

- Code = 483
- Comment = 69
- Blank = 172
- Procedures = 25
- Variables = 1

Information about BS Data Form

Static:

- Code =1159
- Comment = 13
- Blank = 53
- Procedures = 36
- Variables = 1

Information about MCS Data Form

Static:

- Code =1128
- Comment = 13
- Blank = 54
- Procedures = 35
- Variables = 1

Information about Group Members Form

Static:

- Code =45
- Comment = 0
- Blank = 0
- Procedures = 1
- Variables = 0

Information about “About Project Bank” Form

Static:

- Code =45
- Comment = 0
- Blank = 0
- Procedures = 1
- Variables = 0

Information about Log out Form

Static:

- Code = 260
- Comment = 2
- Blank = 10
- Procedures = 4
- Variables = 1

Code Lines:

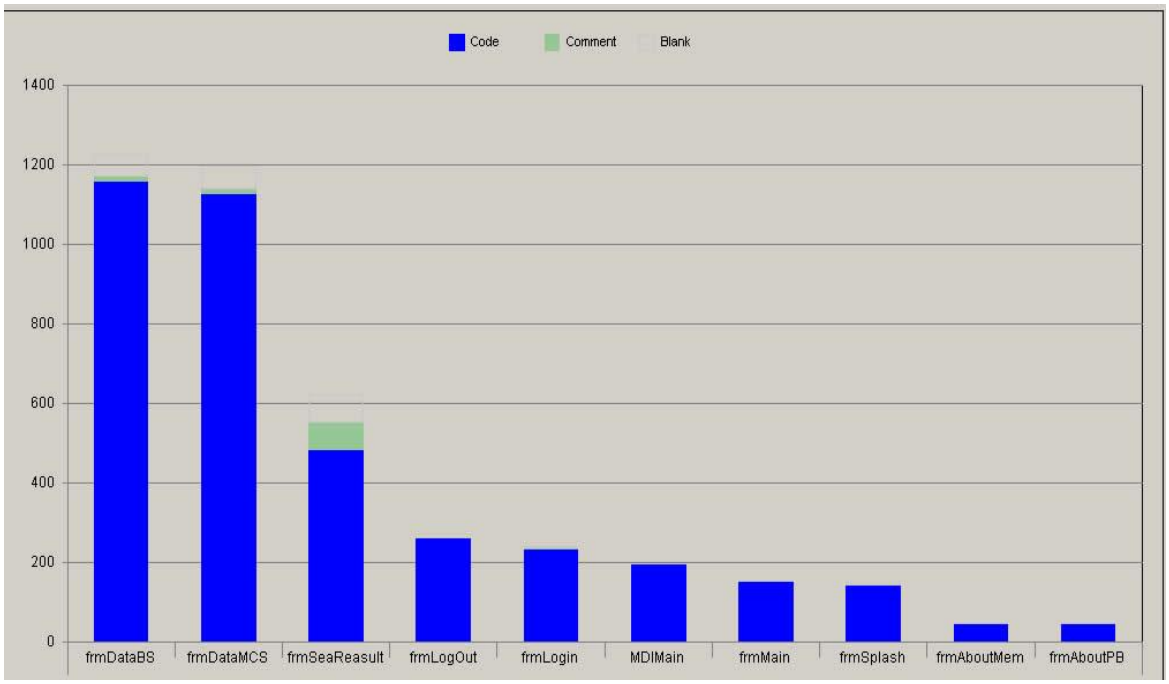


Figure 20a: Summary of Each from according to the LOC per form

Procedures and Variables:

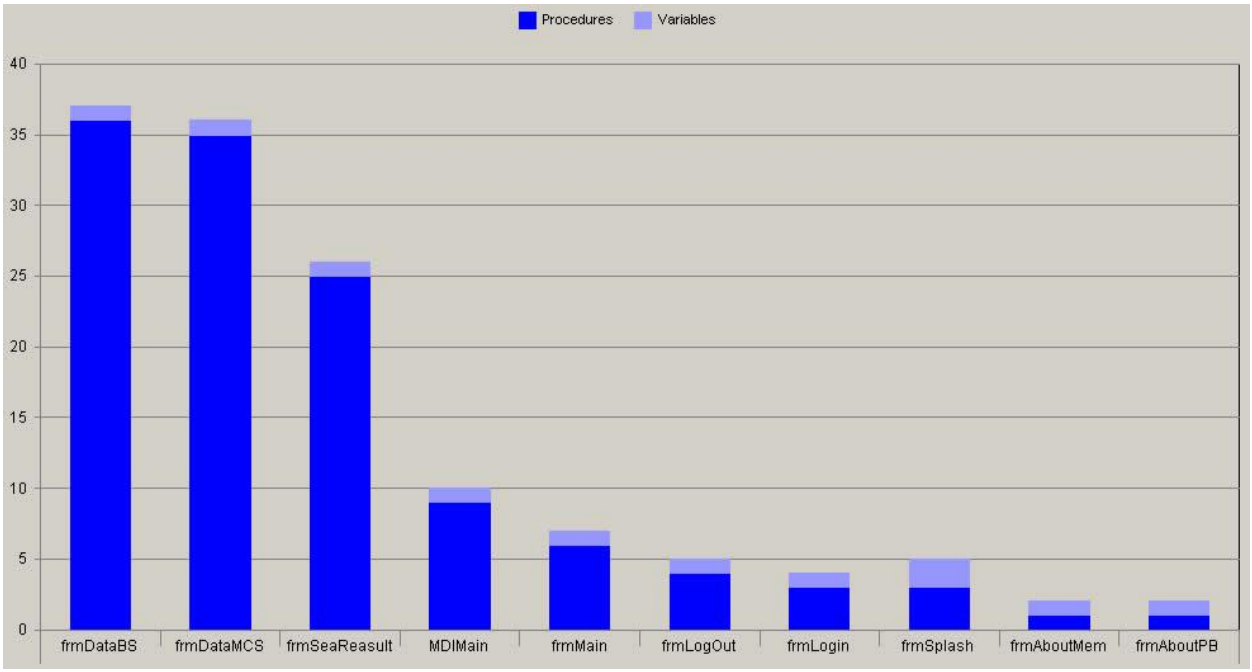


Figure20b: Summary of Each from according to the Procedures and Variables per form

Summary

- Total Code Lines = 3842
- Total Comment Lines = 100
- Total Blank Lines = 197
- Total Procedures = 123

21. Testing

21.1. Test Plan

TEST CASES	OBJECTIVES
1	To test when the program is run, the login module is display at start up and make sure the user has to key-in the correct password before entering main page.
2	Make sure the main page is displayed after keyed-in the correct password.
3	Make sure into the MDI form when clicking any form the previous window/form must be closed
4	Make sure that all buttons are working and shows correct result
5	Make sure that navigate the record as First, next, previous & last
6	Make sure that the adding new record all required field are filled then all to save record
7	Make sure that when deleting record form any where is possible
8	Make sure the Query's BS/MCS Information module enable user to search for technology. Based on inserted query, the search results will be displayed.
9.	Make sure the Query's BS/MCS Information module enable user to search for Supervisor name. Based on inserted query, the search results will be displayed.
10	Make sure the Query's BS/MCS Information module enable user to search for Project name. Based on inserted query, the search results will be displayed.
11	Make sure the Query's BS/MCS Information module enable user to search for student name. Based on inserted query, the search results will be displayed.
12	Make sure the Query's BS/MCS Information module enable user to search for Project name. Based on inserted query, the search results will be displayed.

13	Make sure the Query's BS/MCS Information module enable user to search for Project name. Based on inserted query, the search results will be displayed.
14	Make sure the Query's BS/MCS Information module enable user to search for student name. Based on inserted query, the search results will be displayed.
15	Make sure User Guide manual information will be display.
16	Make sure About Group Members information will be display.
17	Make sure About Project Bank information will be display.
18	Make sure the Exit will end the program.

Table 21.1: Test Plan

21.2. System Testing

Testing is a critical element for software quality assurance. The test process is implemented in our project to execute the system with the intent to find error. Testing task is required to test the system according to the test plan.

Firstly, the login module is tested with Administrator login. With a valid user name and password, the user is able to access to the system according to their authentication control.

Next, the modules of BS & MCS, sample records are inserted in the module for testing. All required fields must be filled in. Else, there will be a pop out of message box reminding the user to fill in the important fields. Incomplete fill-in is not able to add as a new record. The module of query for all two tables of BS and MCS is tested too. Search criteria such as student name, project name, supervisor name and technology to be built is inserted to search record. The function of delete is also working properly. Thus, module is tested successfully. The system is error-free from adding, searching and deleting records.

In sum, the system is free from bugs and errors. All forms are correctly loaded when selected interactive button is clicked. The windows in the system are also able to arrange in cascade, tile horizontally and tile vertically according to user preference's click from 'Window' menu. Information about the system is shown in 'About'. The system is then also tested to exit properly. Finally, the verification is done by S. Ali Jafri to confirm the system meets the specifications of error-free. All tests are successful as expected results.

21.3. White Box Testing

CRITERIA	FULFILLED	REMARKS
Login Page		
Enter valid login Admin as and password. Click Enter (login confirmation) to enter the Main page.	Test successful.	None
Enter invalid login password, click Enter and display invalid password message, require reenter password.	Test successful.	Pop up message box – "Invalid username and password"
Main Menu Screen		
For login, administrator can access to full system features in main menu screen.	Test successful.	None
Program Selection		
Select the specific program like BS or MCS Click done to enter the records	Test successful.	None
Without Select any program to press done there will be pop out a "Please select program" message box.	Test successful.	"Please select program"
All the button in the form are correctly loaded when selected interactive button is clicked	Test successful.	None
BS / MCS Record		
When the forms load all the records (first record) will be shows	Test successful.	None

Make sure that all the input fields are disabled and also required buttons are enabled.	Test successful.	None
If click on the disabled fields displayed message.	Test successful.	"If you want to edit click Edit or Add New record"
When clicking Add New all the fields are enabled and clear also enabled the save& cancel button and disabled the delete and navigation buttons.	Test successful.	None
When add new record all the required fields are field properly other wise display message box	Test successful.	"Please insert the (field name) field"
When delete record, before delete the record their will be a confirm message "are u want to delete the record" then again message box is displayed "record deleted"	Test successful.	None
After delete the record automatically goes to previous or next record.	Test successful.	None
When save the record their will be confirm message to save record	Test successful.	"Record save Successfully"
Search Record		
When the form load all the required field will be disabled and shows the all records on List view	Test successful.	None
To search a project, select the option buttons, make sure that option buttons selected at once	Test successful.	None
When select any option button then related text field will be enabling.	Test successful.	None
Click Quit button to unload the form & Home button to go to the program selection form.	Test successful.	None
Query of Search Record		
o Input the student name to search student with related project. o Input field takes only character not any number other wise show error.	Test successful.	"Please Enter only Character only"

○ Input the Supervisor name to search the supervisor of the project. ○ Input field takes only character not any number other wise show error.	Test successful.	"Please Enter only Character only"
○ Input the Project title to search the project with all information associated with project ○ Input field takes only character not any number other wise show error.	Test successful.	"Please Enter only Character only"
Based on inserted query, the search results will be display by clicking the Search button or text change property.	Test successful.	None
Make sure that if the record is duplicate/doubles then search results will be display all doubles records.	Test successful.	None
About Group		
Display the group information.	Test successful.	None
On the about form click OK to unload the form.	Test successful.	None
Log Off & Exit		
Display a box that confirm to re-login the into the project	Test successful.	None
Click cancel to Quit the application	Test successful.	None
Display a box that confirm to Exit.	Test successful.	None
Exit program by clicking Yes.	Test successful.	None

Table 23.1: White Box Testing

22. Tracking and Control Mechanisms

As most software developers, we will insure high software quality. As most of us know, quality is the conformance to explicitly-stated functional and performance requirements, explicitly documented development standards, and implicit characteristics that are expected of all professionally developed software.

22.1. Quality Assurance and Control

Our team applies quality assurance and control through solid technical methods and measures, conducting formal technical reviews, and performing well-planned software testing. Our team will perform the following:

22.1.1. Prepares an SQA Plans

This plan includes evaluations to be performed, audits and reviews to be performed, standards that are applicable to the project, procedures for error reporting and tracking.

22.1.2. Participates in the development of the Project

Our team will monitor the process to make sure it is complied with our organizational policies.

22.1.3. Participates in the development of the Project Reviews software engineering activities and Audits designated software work products to verify compliance with the defined software process

Our team will perform reviews and audits to identify deviations and track them, and make sure that corrections have been made accordingly.

22.1.4. Ensures that deviations in software work and work products are documented

Our team will ensure that any deviations from the requirements will be documented and described in details.

22.1.5. Records any noncompliance

For every noncompliant process, it will be tracked until it is resolved.

22.2. Change Management and Control

It is sometimes called configuration management, and it is the application of standards and procedures for managing changes in the software project. It will be done throughout the lifecycle of the project especially, and it will be applied to the code, the documentation and the data according to any changes that might happen along the way.

23. Conclusion

The answer to information technology is a theoretical and an empirical, hands-on discipline. The objective of this project, which aims to expose Bachelor's Program undergraduate student through the practical experience of working on a large project, has given us a chance to put into practice of the software development concepts that we have only been studied in theories. We are trained to work effectively as part of team, interacting with users, developing specification and documents developing prototypes and improving our writing and oral presentation skills.

Throughout this semester, we have developed a Project Bank System. The system is proposed during title selection of projects. The computer-based Project Bank system is developed to manage the record of student's final project. During this project, we expect a chance to sharpen our skills on technical, analysis or interpersonal skills. This project is finished according to software development life cycle approach and through this approach we were able to learn more on practically how to work in a project whether individually or in a group.

On the early stage, we developed the problem project scope and objective to determine requirements to make the project successfully. There were a few types of modeling we used such as, Data Flow Diagram - Context Diagram and Level 0 Diagram, and to help all group members to visualize how the system is going to be. Then, the physical visual system is developed using Microsoft Visual Basic 6.0 and the database storage managed by SQL.

While developing the system, we encountered a lot of problems in visual basic coding. It is the most problematic part of the entire project. There were errors in programming and coding. We find references from websites and library. Then, we discuss with our project's supervisor to have the solutions. Through the process, we have expanded our knowledge in visual basic programming. We have also known on connectivity between the visual basic systems to the database manager (SQL).

Finally the project is completed with the effort of all group members working together relentlessly. A good teamwork is contributed in this project where group members were co-operated and well hold their responsibility. Special thanks to as our supervisor Syed Asif Ali of this project who taught us important criteria and skills needed to successfully fulfill the course requirement.

Appendix A: Proposal Letter

Teacher Proposal Letter

Group Members	Muhammad ATIF Muhammad NADEEM	
Class	BS(CS) – 5th Semester	
Proposal	Sir FARHAN SHAFIQ	
Project Title	Project Bank	
Description	To maintain the whole record of the projects made by students with their supervisor name and group members.	
Objectives	To provide a more efficient and convenient service.	
Summary	Features List of project titles List Of Supervisor of the projects List the Groups in Particular Semester	 Search by project Title Search by Date List the Groups in Particular Semester
Project Application	Applicable in Universities, Institutes to sort and record the information of the projects made by students.	
Resources/ Tools Requirements	Hardware Requirements	
	Systems	Intel Pentium 800Mhz
	Storage Media Backup Storage Media	Hard-disk Monthly bases to write on CD
	Other's Devices	Printer required, CD Writer
	Software Requirements	
	Operating System	Windows[Me,XP,2000]
	Application Tools	Front End:VB-6.0 Back End: MS Access Application: Crystal Report 8.0
	CASE / Supporting Tools	Ms Project 2003, Ms Visio, Erwin Modulator 4.1
Student's Signature	Muhammad ATIF , Muhammad NADEEM	
Supervisor's Comments		
Supervisor's Signature		
Project Coordinator's Signature		

Appendix A: Interview Session

We start our interview section with Mr. Farhan Shafiq which is Senior Instructor in department of computer science sharp at 11:00 o ‘clock. S.Ali jaffri and Faisal Abbas in charge to ask question regarding the project submitting system, below are the dialogs between us.

Q: Good morning Mr. Farhan. I am S. Ali Jafri, group leader of our project, nice to meet you. Let me introduce, this is Faisal Abbas and this is Mazhar Hussain. We are all 5th semester BS (CS) student from Federal Urdu University.

A: Nice to meet you too. Is there anything that I can help you all?

Q: Yes, we are here to know details about the project of the final year student what is the process of student submitting project?

A: O.k. The student submitting their final report to the department associate with supervisor of that project and after check/approves project the record will entered.

Q: Ic. Can you use any computer database for entered the record?

A: No! The record enter in files manually

Q: Is there some restriction about final group members?

A: Yes. The student doesn’t allow more than 3 members in a group.

Q: Can you assign any specific Id or number to a group?

A: It’s not necessary, but the group identification is done by roll no or by batch with year.

Q: The procedure is for BS and MCS for submitting project is different or same?

A: Almost same procedure.

Q: The information like Group name and Course name is needed?

A: most of the group assigned her group name but the course name is not really needed

Q: Is the project description is required?

A: Yes in some case the project description is required.

Q: Any suggestion regarding our entities?

A: O.k. you should add a submitting date of project it's is very useful information for the department.

Q: The searching option like search by technology is useful?

A: Yes. It is very useful searching option in the database, its help to search the project by front end.

Q: Do you suggest any search option for project bank system

A: Yes I will suggest that you can search project by submitting date of project.

Q: I think we have got the information that we need from you. This is our last request. Can you give some record for the student that submitted their project?

A: yes, no problem.

Q: Thanks for corporation Mr. Farhan

A: Welcome.